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Symposia on Cerebro-Spinal Meningitis and Tuberculosis

VOLUME VII FEBRUARY, 1914 NO. 2

Southern Medical Journal

Journal of The Southern Medical Association

THE TRUTH AND THE TRUTH ONLY ON EVERY PAGE FROM COVER TO COVER

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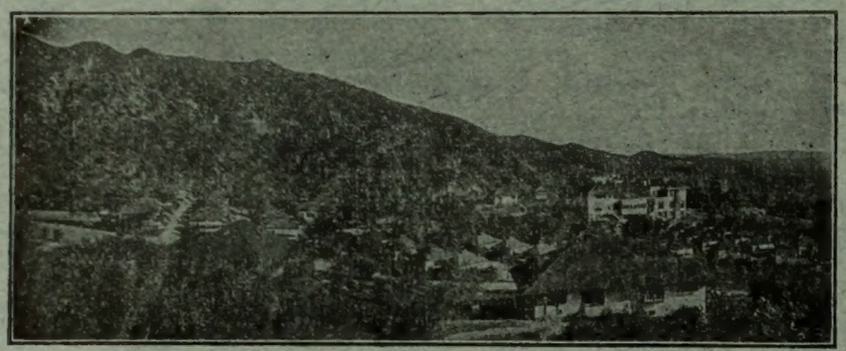

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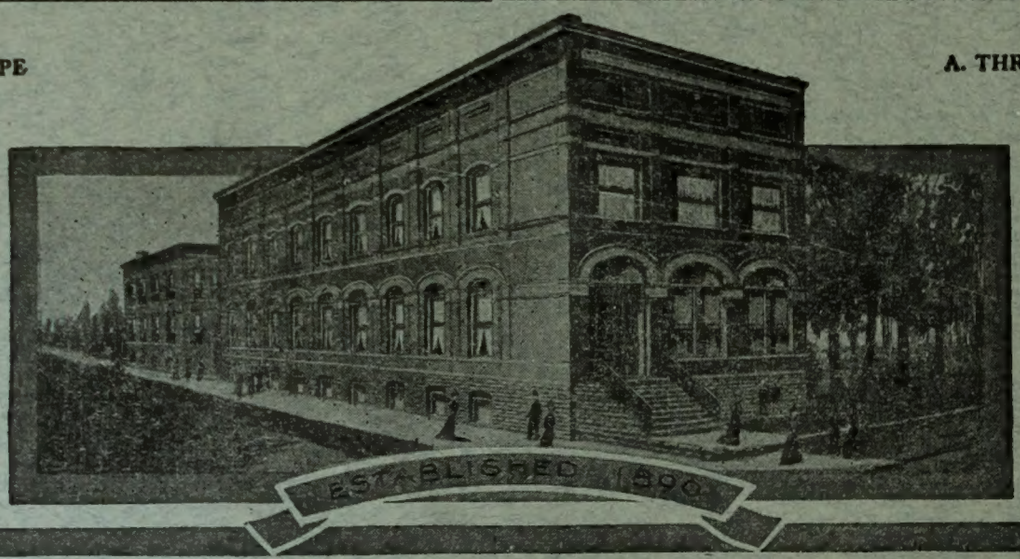

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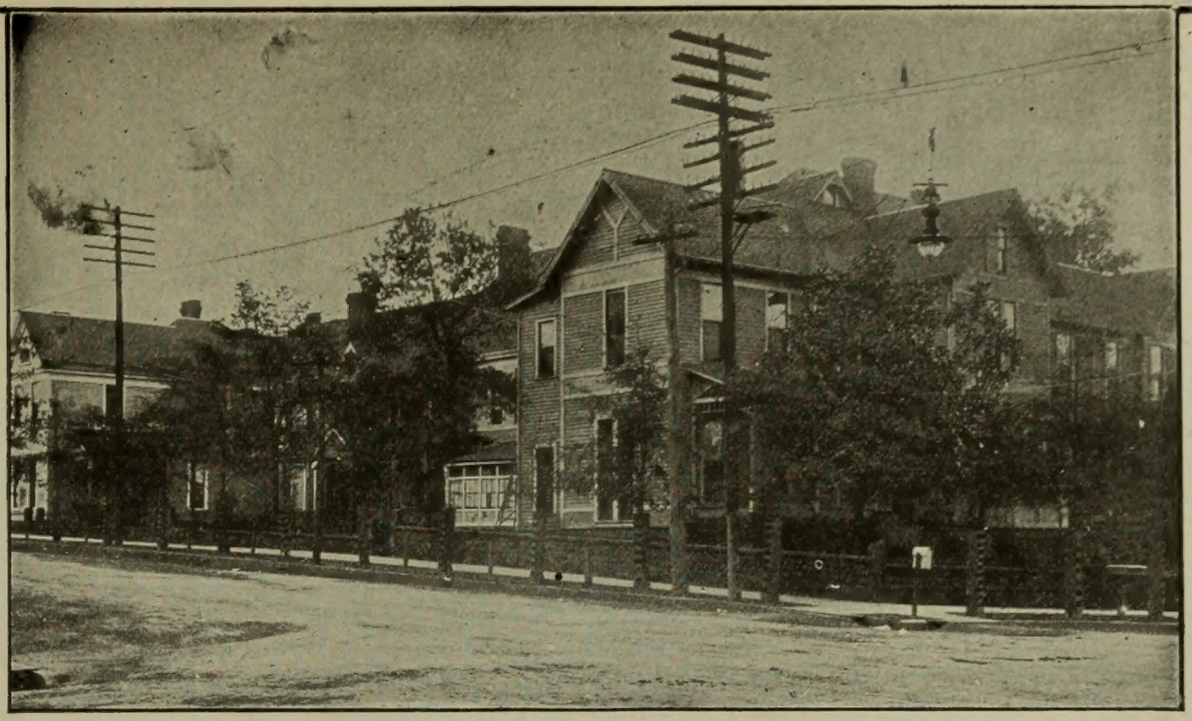

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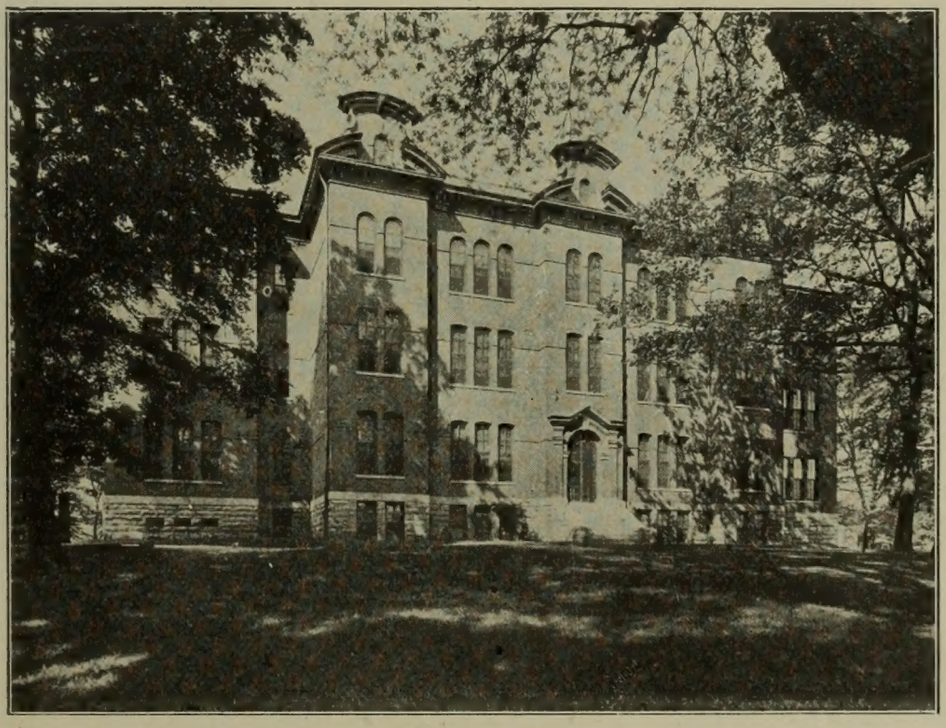

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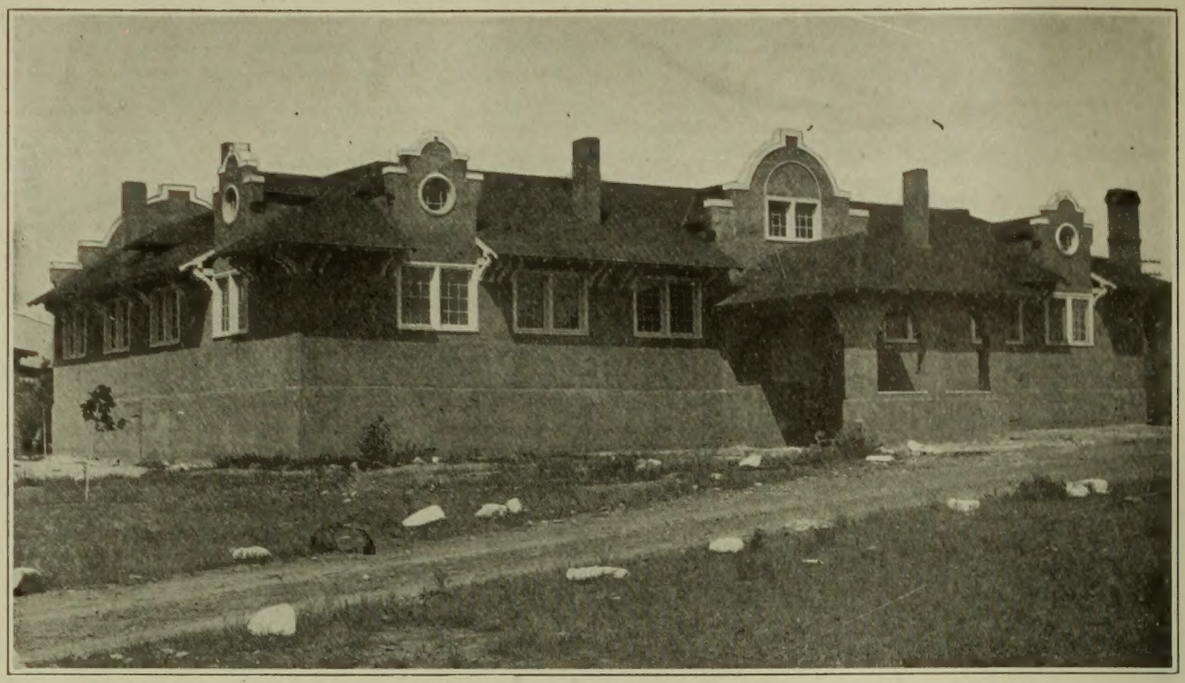

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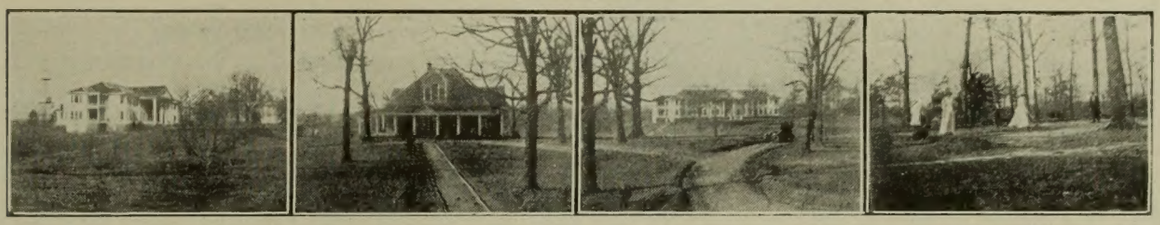

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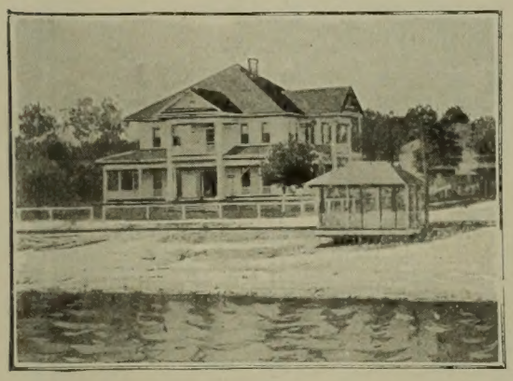

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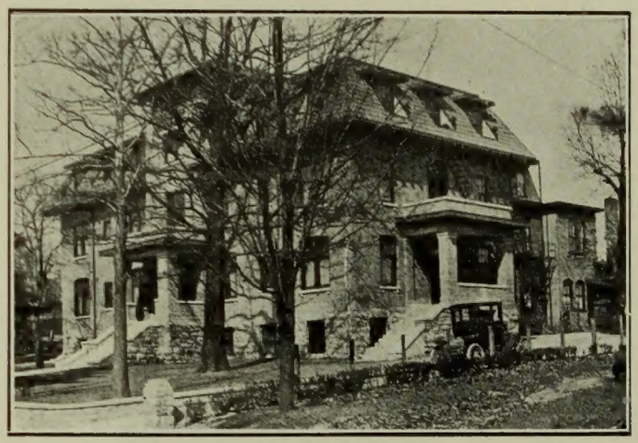

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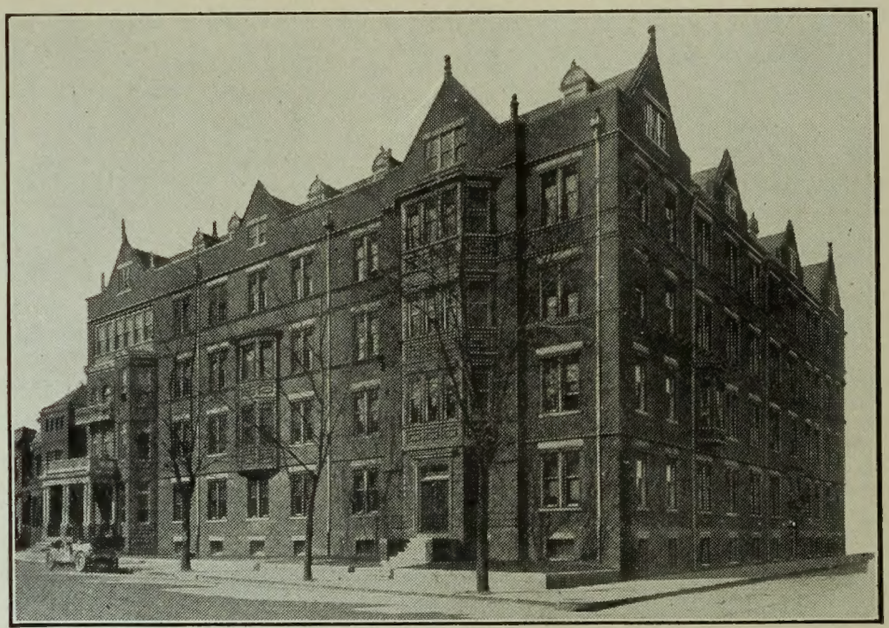

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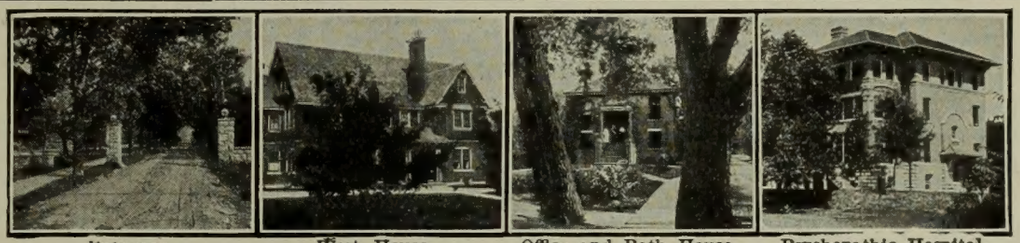

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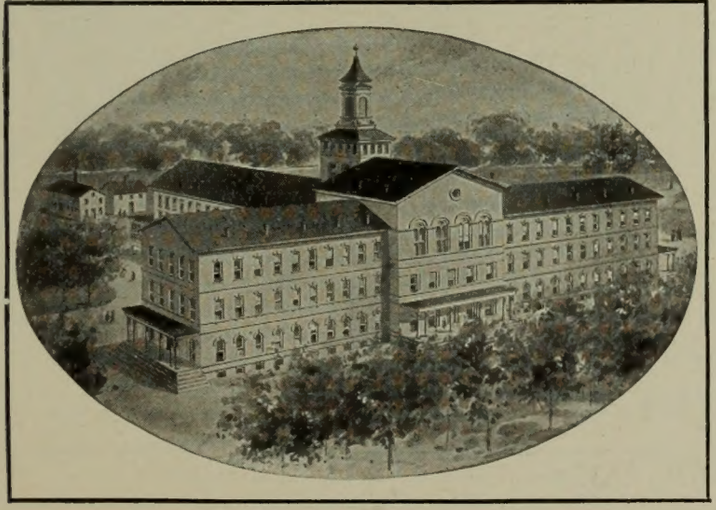

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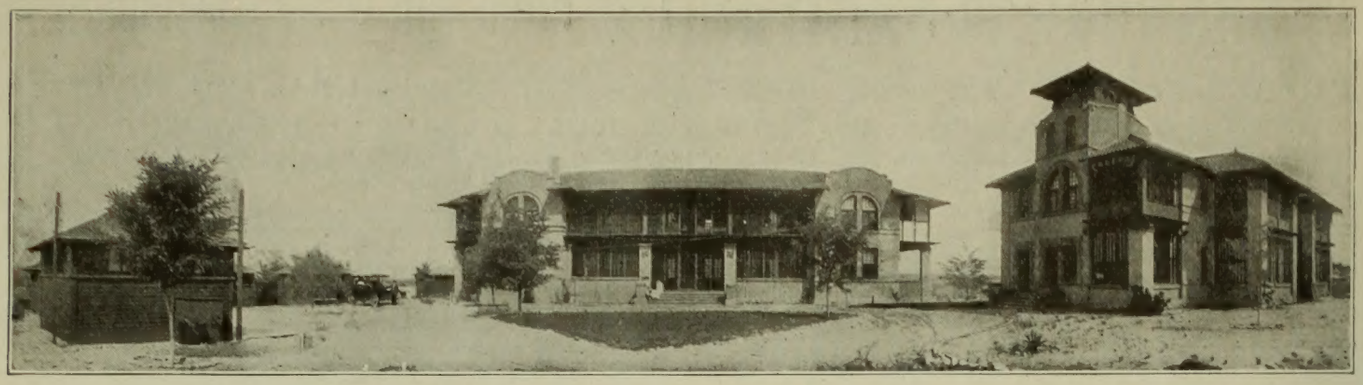

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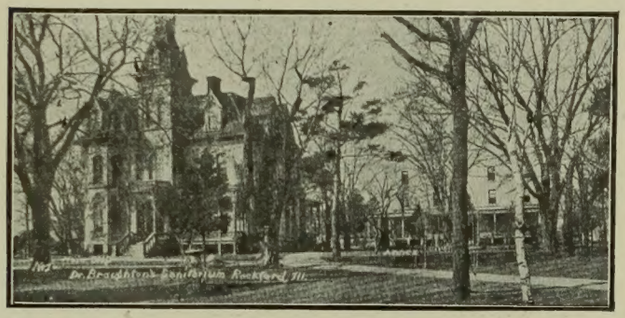

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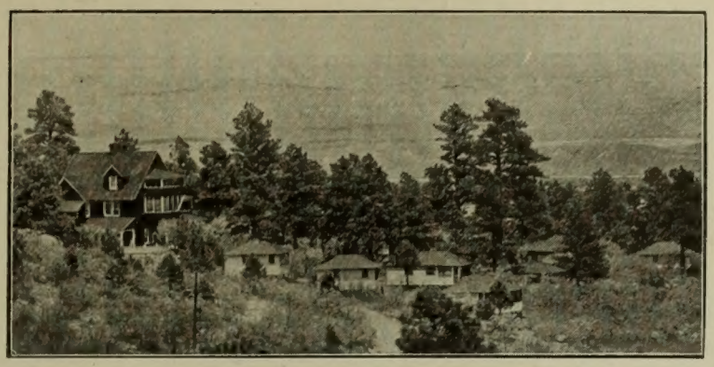

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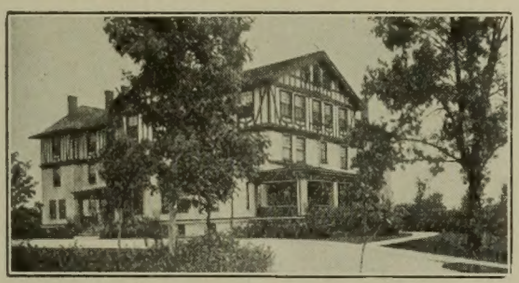

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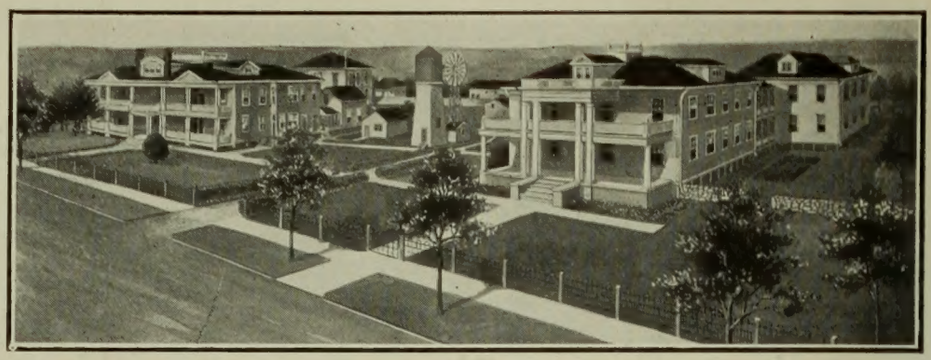

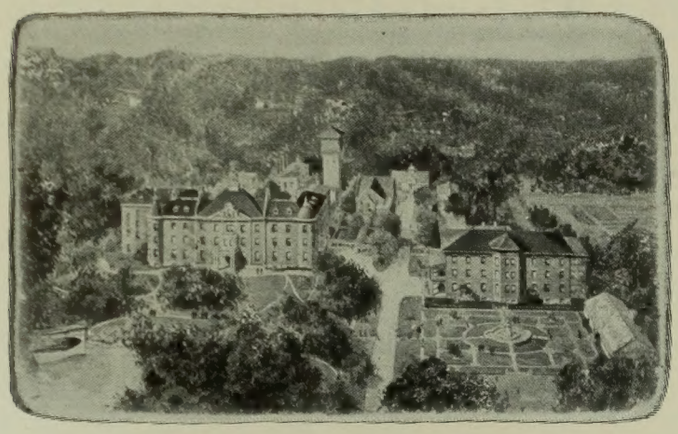

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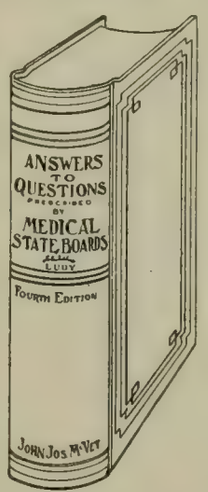

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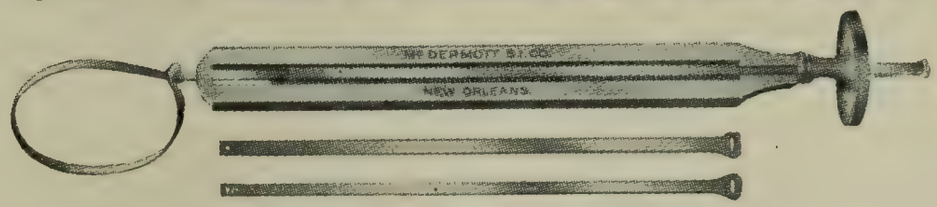

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SOUTHERN MEDICAL JOURNAL

PUBLISHED MONTHLY

Volume VII NASHVILLE, TENN., FEBRUARY 1, 1914 Number 2

ORIGINAL ARTICLES

CEREBRO-SPINAL MENINGITIS WITH SPECIAL REFERENCE TO CERTAIN SIGNS OR MEASURES.*

By Randolph Lyons, M.D.,
New Orleans, La.

My excuse in presenting this subject at the present time is that cerebro-spinal meningitis has of late assumed an aspect of greater importance, especially to Southern physicians, owing to the recent epidemics in the South and Southwest. As a result of these epidemics sporadic cases have become more frequent even in localities where no general outbreak occurred. With the advent of specific therapy, the necessity of recognizing the disease in its early stages becomes a matter of great significance, since we find the prognosis is markedly dependent upon an early diagnosis with prompt institution of serum treatment. This fact is confirmed by all statistics, whether European or American.

Flexner[1] in his recent analysis of 1,211 cases, according to the period of the injection of serum, states that the mortality from the first to the third day was only 18.1%, from the fourth to the seventh day 27.2%, and later than the seventh day 36.5% of the cases died. In discussing these figures Flexner writes, "This table not only establishes the fact that the earlier the serum is given the better the results, but emphasizes the too common delay in making the diagnosis or of bringing the majority of cases under specific therapy. Less than one-third of the cases had the benefit of early injection, and one-half received the first injection later than the first week of illness." This statement scarcely requires any comment, for it is quite evident that in many instances we fail to recognize the disease at a sufficiently early period.

A number of special signs or measures have accumulated in the literature which have been recommended as valuable adjuncts in the diagnosis of cerebro-spinal meningitis. In the past few years pediatricians have been particularly industrious in this line, and have advocated several new signs in children and infants. The relative merit, however, of these procedures in adults does not seem to be clearly established. Because of these facts I began two years ago a systematic examination of all cases of meningitis (meningococcic) that came under my observation with reference to the presence or absence of certain signs and symptoms. Owing to limitation of time the symptoms have not been included in this report. A few signs have also been omitted, such as Parrot's sign, because of its inconstancy. and the signs recently discovered by Holmes[2] and Barnes[3], and others, because of insufficient data.

An analysis of twenty-one cases forms the basis of the present paper. The patients were males, and all but two were colored. The average age was twenty-three years. There was but one child in the series (5 years). Nineteen of the cases were treated in the Charity Hospital of New Orleans.

DESCRIPTION OF SIGNS OR MEASURES.

The value of a special sign or procedure in a given disease is chiefly dependent upon two

*Read in Section on Medicine of the Southern Medical Association, seventh annual meeting, Lexington, Ky., Nov. 17-20, 1913

factors: first, whether it is always or commonly present in that affection, and second, whether it is present early in the disease. From a practical and therapeutic point of view, the second qualification has by far the greater significance. In hospital experience, however, these factors not infrequently resolve themselves into whether or not the sign was present on admission, or developed later, for it may not be possible to ascertain the date of onset in every instance. This occurred in two cases of this series. Upon these lines the following measures were studied: (1) Babinski's sign; (2) Macewen's sign; (3) Patellar reflexes; (4) Brudzinski's contralateral reflex; (5) Brudzinski's "Neck sign;" (6) Kernig's sign; (7) Rigidity of the neck; (8) Lumbar Puncture.

BABINSKI'S SIGN.

Babinski's sign was present in only three of the twenty-one cases, or 11.6%. In two of these cases the sign was elicited on first examination, which in one patient corresponded to the sixth day of disease. The date of onset in the other case could not be obtained. In the third case the sign appeared two days after admission, or the fifth day of his illness.

MACEWEN'S SIGN.

This sign consists in the production of a tympanitic or hollow note on percussion over the inferior frontal or parietal bone when the patient is in the upright position with head inclined to one side. Its use has been mainly confined to meningitis in children. especially of the tuberculous type.

Macewen's sign was positive in but one of the twenty-one cases. This patient was five years of age and the only child in the series. The sign appeared on the fourth day of the disease and two days after admission.

PATELLAR REFLEX.

The condition of this reflex was examined in 20 cases. The knee jerks were present in 12 and absent in eight cases. Curiously enough the condition of the reflex as discovered on first examination remained practically constant throughout the course of the disease. In the eight cases in which the knee jerks were lost, four recovered, but the reflexes did not return until convalescence.

No prognostic importance could be obtained from the state of the reflexes, as the mortality in both patients with or without knee jerks was practically the same.

The measures thus far enumerated can be said to have but little value in the adult form of cerebro-spinal fever. In justice, however, to the first two signs, Babinski's and Macewen's, it should be stated that there is considerable evidence to be found in the literature as to their probable usefulness in the meningitis of children and infants, and particularly in the tuberculous type.

BRUDZINSKI'S SIGNS.

These signs consist of two distinct procedures, which will therefore be considered independently. They are the (a) contralateral reflex and (b) the "Neck Sign." The contralateral reflex was discovered by Brudzinski[4] in 1908 and confirmed in 1909 by Greco[5] in cases of tubercular meningitis in childhood, and by Zaimorsky[6] in infantile affections of the meninges. During this same year Brudzinski described a new sign which he designated the "neck sign." In this paper he compares his two signs with Kernig's and Babinski's in forty-two cases of various forms of meningitis, with the following results: The "Neck Sign" was positive in 97%, the contralateral reflex in 66%, Kernig's sign in 57%, and Babinski's sign in 50%. All cases were children. In this country Morse[8] studied Brudzinski's signs with reference to their diagnostic value among infants and children, and concludes that neither of the two signs is present in well children or those ill with diseases other than of the nervous system, and that they are very seldom met in diseases of the nervous system outside of meningitis.

The contralateral is much less important than the "neck sign." They occur in all types

of meningitis and are of no importance in differentiating between them. Their absence does not exclude meningitis.

(a) The Contralateral Reflex: This consists of a concomitant reflex of the leg on one side when passive flexion is made upon the other leg—(this is known as the identical contralateral reflex). Occasionally the motion of the other leg is extension instead of flexion, and this is termed the reciprocal, contralateral reflex. The reciprocal is so exceptional as to be negligible.

The contralateral (identical) reflex is elicited then by simply flexing one leg on the trunk, which produces the same movement in the other leg. The sign may be present in one or both legs. When present in my cases the sign was positive in both legs, though exceptionally more marked on one side than on the other. This sign was met with at some time during the disease in eleven cases, or 50.2%. It was positive on first examination in only seven cases, or 33.3%. The duration of the disease in six of these seven cases averaged less than three days. The seventh case was a chronic one of five weeks' duration.

(b) The "Neck Sign:" This is obtained by passively flexing the neck forward, which causes (according to Brudzinski) flexion of the legs at the hips and knees and flexion of the legs on the pelvis, which may at times be very marked. Brudzinski cannot entirely explain the neck sign. He does not believe that it is due to pressure or pain, but says: "It is probable that, in conformity with Chauffard's hypothesis for Kernig's sign, the most important role is played by a muscular hypertonus of the legs and a physiological predominance of the extensor muscles of the neck and back over the flexor muscles of the lower limbs." That this statement of the mechanism of the sign is not very satisfactory is admitted by its author, who concludes by hoping that further research will yield a more precise explanation.

The "neck sign" was positive at some time during the disease in nineteen of twenty-one cases, or 90.4%. In seventeen of these cases (76%) it was found on admission. The sign could not be demonstrated in one patient because of marked retraction and rigidity of the neck muscles which rendered passive flexion of the head practically impossible. The average duration of the disease for fifteen of these seventeen cases was 3.4 days. The date of onset in the remaining two cases was unknown.

The relative value of these two signs is fairly in accordance with Brudzinski's series of cases in children, though the percentages of positive results are somewhat lower. When, however, we come to analyze these signs from the standpoint of early diagnosis, their value is still further diminished, and we find the contralateral only gives 33% of positive results in adults. The "neck sign" with 76% of early positive results has proved to be of considerable usefulness.

KERNIG'S SIGN.

This sign is so well known that it requires no description, although in adults especially it is not always easy to determine where Kernig's sign begins and at what angle the normal resistance occurs when an attempt is made to straighten the leg on the thigh. Koplik[9] considers Kernig's sign present when resistance is met with within the limits of an angle of 90° to 135°. A few years ago Kernig stated that his sign was not so frequent in children as in adults, and that it appears more slowly and later in tubercular than in cerebro-spinal meningitis.

The present series of cases in adults, as well as cases seen in previous years, is in conformity with the first part of this observation.

Kernig' sign was present at some time during the disease in all of the cases, and on first examination in all but two, or 90%. The previous duration of the disease for sixteen of the nineteen cases averaged 3.6 days. It is possible that one of the two negative cases might have been classified as slightly positive,

but was not rated as such owing to the difficulty mentioned above of determining very moderate degrees of Kernig's sign.

RIGIDITY OF THE NECK.

Rigidity of the neck was found to be a most valuable sign. It was discovered on first examination in every case but one, or 95%. In this instance the patient was in a moribund condition when admitted to the hospital, and died within twenty-four hours.

The rigidity varies greatly in degree, from a slight stiffness to extreme spasm and retraction. The restriction of motion in the neck is chiefly that of flexion, the lateral movements being frequently unimpeded. We find usually associated with the rigidity some pain and tenderness. Attempts to straighten or bend the neck, as in Brudzinski's "Neck Sign," generally elicit more or less pain. Pressure over the muscles or pinching the skin of the neck will very often demonstrate tenderness, and is at times accompanied by a dilatation of the pupils (Parrot's sign). This mydriasis has been ascribed to irritation of the cervical nerve roots and thereby also the sympathetic fibers. Unfortunately for this hypothesis dilatation of the pupils may also be observed in the performance of Kernig's sign and the contralateral reflex. As all of these procedures cause more or less pain, this may be the chief factor in its production.

LUMBAR PUNCTURE.

The technic of lumbar puncture does not require any description, although the not infrequent reports of "dry taps" bear witness to the fact that this procedure is not always a simple matter. It is hard to believe that in all of these instances there was some obstruction to the flow of the spinal fluid from the brain to the canal. The facts are that in many cases the conditions under which puncture is performed are unfavorable. The unfortunate patients are often unable to assume the proper position for puncture by bending forward so as to increase the distance between the arches. On the contrary the back may be rigid or even in the position of opisthotones. In such cases if the needle be introduced a little to one side of the median line and in a considerably more upward direction (towards the head) than is customary, e. g., at a more acute angle with the back, and more deeply (4 to 7 cm.), the fluid will sometimes be readily obtained. The anatomical reasons* for this can be easily verified on the skeleton or cadaver. Occasionally it is necessary to use a general anesthetic to overcome the muscle spasm, and an anesthetic should always be at hand. In exceptional cases a dry tap is due to excessive thickness of the exudate or because the needle has been plugged while penetrating through the tissues. This latter factor is easily obviated.

In the present series 76 punctures were performed without experiencing a dry tap, although in some instances considerable difficulty was encountered in entering the canal, necessitating at some time the use of an anesthetic in eight cases.

As an early diagnostic measure, lumbar puncture has proved to be of the utmost value. The first puncture established the diagnosis in all but one of the cases, or 95 per cent. The duration of the disease for eighteen of the twenty positive cases averaged 3.9 days.

In the case of the puncture which was negative, in attempting to penetrate the canal, a small vessel was ruptured, so that when the fluid was finally obtained it was extremely bloody, and no growth occurred in cultures.

Spinal Fluid.—A provisional diagnosis of meningitis could be made from the macroscopic appearance of the fluid on the first puncture in twenty of the cases. All the fluids showed varying degrees of turbidity and increase over normal pressure. The fluid

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*The anatomical reasons are as follows: (1) When the spine is in extension the spinous processes tend to approximate each other, hence the reason for avoiding the median line. (2) When the spine is in extension the entrance through the arches to the canal is larger in the direction mentioned than horizontally. (3) As the distance to the canal in the more vertical direction is greater, the needle must be inserted more deeply.

in seven cases showed at times a yellow tint presumably due to hemoglobin. It is not within the scope of this paper to take up a consideration of the cytology and bacteriology of the spinal fluids examined. Suffice it to say that in the vast majority of the cases smears made directly from the centrifugalized specimens demonstrated gram-negative cocci, morphologically like the meningococcus which were later identified by culture.

SUMMARY.

The actual value of the procedures described cannot be accurately judged by so small a series of cases; nevertheless, the results are suggestive, and appear, in general, to be in conformity with the experience of others in the adult form of cerebro-spinal fever. The relative importance of Brudzinski's signs has not, to my knowledge, been carefully determined in adults. From the point of view of early diagnosis the eight measures fall into the following order of importance:

Lumbar puncture stands first among the special measures. The initial puncture established the diagnosis in 95 per cent of the cases.

Next in importance is rigidity of the neck. This could be demonstrated in twenty out of the twenty-one cases on first examination, or 95 per cent.

Kernig's sign comes third. It was present on first examination in 90 per cent of the cases and at some time during the disease in 100 per cent.

The "neck sign" falls into fourth place. We find that Brudzinski's statement with regard to the relatively greater value of his "neck sign" over Kernig's sign in children, does not hold good for adults. It was found positive on admission in 76 per cent of cases and could be elicited at some time during the affection in 94.4 per cent.

Brudzinski's contralateral (identical) reflex comes fifth on the list, being present on first examination in only 33.3 per cent of the cases It was positive at some time during the disease in 50 per cent of the cases.

Babinski's sign occurred in but three cases, or 11.6 per cent, at some time during the disease. In two of the cases it was positive on admission.

Macewen's sign was found to be practically of no value in this series. It could be demonstrated in but one instance. This patient was the only child (5 years) in the group. The field of usefulness of this sign, as well as Babinski's, seems to be limited to meningitic affections of early childhood.

Lastly, the presence or absence of the patellar reflexes was found to be of no apparent diagnostic or prognostic importance.

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THE BACTERIOLOGY OF CEREBRO-SPINAL MENINGITIS.*

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The inadequacy of medical terminology leads to considerable confusion in the interpretation of certain combinations of clinical and pathological phenomena, and is too often

*Read in Section on Medicine of Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

restricted by custom to a predominating origin; the fact of less frequent causes bringing about such a chain of symptoms being overlooked. Hence faulty diagnosis and the attendant wrong treatment, with misleading results. The most careful and detailed laboratory examinations must be the chief aid in clearing up such doubts.

The many factors entering into the consideration of the bacteriology of an infectious disease are of general significance and applicable to most pathological conditions of microbic origin.

First, while a specific micro-organism possesses a selective affinity for a certain type of tissue and by preference a definite location, yet it may under some conditions, primarily, establish itself at an unaccustomed point.

Second, where the site of the lesion is exposed to the influence of other organisms such as occur in the nose, throat, etc., it is at times difficult to decide which is the invading organism, and also it is frequently misleading, when upon examination at the termination of the disease, the exciting germ has been overgrown by the adventitious bacteria, in some cases innocuous and in others setting up secondary lesions.

The diagnosis of cerebro-spinal meningitis is comparatively easy on account of the bizarre picture presented by the clinical symptoms. The underlying cause of this condition is rarely so clear. And it is only through the medium of a thorough bacteriological examination that a differential diagnosis can be approximated and a guide afforded for the institution of proper treatment, which in this disease is vitally dependent upon etiology.

Though Weichselbaum described the micrococcus intracellularis in 1887 and announced its causal relation to epidemic cerebro-spinal meningitis, it was not until about 1905 that this organism was generally accepted as the specific agent in this disease and the infectivity thereof definitely recognized.

More careful bacteriological study has led to differentiating it from other forms presenting the same symptoms, and to specific treatment.

In cerebro-spinal meningitis of the epidemic type, the meningococcus intracellularis of Weichselbaum is usually found in the spinal fluid incorporated in the leucocytes, and when so found, diagnosis is easy; but failure to find the organism, or the presence of complicating organisms, adds to the difficulty.

Failure to find the organism may be due to very few organisms being present (centrifuging and continued searching should overcome this); or to too long a time elapsing after withdrawal of the fluid before examination is made (the organisms autolyze very rapidly and after six hours may disappear completely from the specimen); or the lesion may be confined to the ventricles and the organisms held *in situ* by the tenaciousness of the exudate; or absence of other organisms; and the clinical symptoms, history, etc., must then be relied upon.

In identifying the micrococcus intracellularis several groups of gram negative cocci must be considered, such as—

(1) Pseudomeningoccus.
(2) Micrococcus gonorrhoea.
(3) Micrococcus catarrhalis.
(4) Micrococcus pharyngis siccus.
(5) Diplococcus mucosus.
(6) Chromogenic gram-negative cocci.
(7) Parameningococcus.

Most of these groups may be distinguished by their cultural characteristics, with the exception of the gonococcus and the parameningococcus growing very readily upon artificial media and varying in their actions upon sugars. The micrococcus gonorrhoea is not found in the same locations as the miningococcus and usually can be excluded upon this ground. The parameningococcus, however, is frequently found in the nasal secretions and cannot be readily distinguished from the true organisms excepting through its antibodies.

The point has been raised as to whether

the organism found in sporadic basilar meningitis differs from that found in epidemics of the cerebro-spinal type. Wollstein, after exhaustive experiments along these lines, reached the conclusion that the organisms were identical and the serum results were the same in both. It is not unusual to find other bacteria associated with the meningococcus in the spinal fluid. These may be accidental, secondary, or a mixed infection. The latter condition, according to Elser, is rare.

The method by which infection proceeds has been a matter of some discussion. The consensus of opinion favors the view that the meningococcus appears first in the general circulation before becoming localized, being transmitted from the nasal tract. The fact that primary lesions, due to the meningococcus, have been found to exist in the joints, and the membranes of the heart would lend weight to this view.

The mode of transmission is from host to host, but contrary to the rules followed by many infectious diseases, the healthy carrier rather than the patient is more often the direct source of infection. Elser and Huntoon called attention to this fact in 1909 and Bolduan in 1905 placed very definitely the spread of this disease through the mother of children suffering from cerebro-spinal meningitis. Meningococci were found in abundance in the secretions of the naso-pharynx of the mother, though she herself never succumbs to the disease. Various authors have found upon examination about 93 per cent of those coming in contact with the disease to be carriers.

The viability of the meningococcus is extremely low. It lives only a few hours in direct sunlight, is susceptible to high and very low temperatures, and is rarely found in the nasal cavity of patients recovering from this disease more than from five to ten days. The enzyme which is found in this organism, however, has been found to be very persistent, and after autolyzation of the bacteria, destroys other organisms. The period of incubation, whlie not definitely settled, seems to be anywhere from seven to fourteen days.

Considerable work has been done along the lines of immunity, and the value of the various tests has been very thoroughly worked out. Elser and Huntoon worked out very carefully the agglutination reaction of the meningococcus and allied organisms, and while common agglutinins up to a low index are found to exist between the various gram negative cocci, when the higher indices are reached the allied organisms drop out and the meningococcus alone continues to be agglutinated by the hemologous serum.

Verderame found that the agglutination reaction was fairly reliable when sufficient time elapsed after the initial symptoms for the formation of the antibodies; that the fixation of complement test was not practical, as it did not differentiate sufficiently the gonococcus and catarrhalis from the meningococcus. McGregor found that the opsonins in the blood of patients suffering from cerebro-spinal meningitis corresponded to the agglutinins except in rare instances, but the agglutinins and opsonins were absent from the cerebro-spinal fluid, although existing in considerable amounts in the blood. It is well worth while to make the agglutination test in cases of a week or more duration.

Primary cases of pericarditis, joint lesions, iritis, etc., have been reported where the meningococcus was found to be the only invading organism.

Cases of cerebro-spinal meningitis, due to the typhoid bacillus, bacillus of tuberculosis, bacillus of influenza, the pneumococcus and pyogenic organisms, can in most instances be differentiated by finding any one of the above organisms in the spinal fluid. Such cases may be found coincident with epidemics of meningococcal origin.

Secondary cases of cerebro-spinal meningitis are found in many of the infectious diseases, following lesions of pyogenic origin. Henry reports a case following super and sub-

maxilary abscesses due to the fungus actinomyces. Such cases may sometimes puzzle the physician when occurring in the midst of the epidemic form.

It is rarely possible to wait for a bacteriological examination to be made before treatment is instituted, but in cases where antimeningitis serum is used, the laboratory findings can frequently be obtained before the second dose is given.

DISCUSSION OF THE SYMPOSIUM ON CEREBRO-SPINAL MENINGITIS.

(Papers of Drs. Lyons, Litterer, and Collins.)

Dr. R. H. Von Ezdorf, Mobile, Ala.—I did not know that my name would be put down on the program to discuss the subject of cerebro-spinal meningitis until a few days ago, when I was informed by letter that I was to take part in this symposium.

My experience with cerebro-spinal meningitis has been principally from a public health officer's standpoint, and in that connection advisory to the State Boards of Health and through them to county and local health authorities. The question that interests me most is the practical application of such studies as have been made by Dr. Litterer and other bacteriologists for the control of the disease. When one goes into an epidemic he learns that the people are panic-stricken; that counties quarantine against each other, schools are closed, business places are closed, and people are at sea and do not know just what to do. As a consequence, they want to know what is best to be done, and when one gets into a small town or some large town, naturally he has to study the particular local conditions before making recommendations. For instance, I have been in towns where there would be a willingness on the part of the health authorities to expend money for the treatment of the cases by means of serum. The doctors, knowing they would get the best results from that source, would naturally favor it, but the question of handling the disease is one where most health authorities seem to be at sea and do not know just what to do. My opinion is that the best thing to do is to try and establish a hospital, in some small building or vacant house. The cases should be isolated as early as possible and treated. In a hospital these patients will be surrounded with the best possible conditions, which many individuals cannot get at their homes. Particularly is this the case with the colored race. For instance, I have seen two colored children down with the disease in one bed, being treated with serum, and the bedding wet with urine. These are conditions we see, and naturally we have to meet them, and so I would advise in these particular towns the establishment of a hospital under any circumstances which will make for much better results and a much lower mortality. It is unquestionably the best not only for the patients themselves but for their families.

In connection with the hospital I have advised the establishment of dispensaries. By establishing such a service, persons who have been exposed to meningitis can be treated by spraying the nose and throat, in particular those members of families who are laborers or bread-winners where a case of meningitis has developed. It is very important that something like that be done. I find in some towns that the authorities would furnish one hand spray for the use of one entire family without instructions as to their proper use and in particular the need of disinfecting. I obtained a history of possible infection in one case—the tip of the spray before and after use, on account of the general use of the spray without taking precautions to disinfect the tip after use. If the spraying is done well and properly, as it can be done in a dispensary, it would meet the conditions much better, and good results may be looked for, as pointed out and proved by the investigations made by Dr. Litterer.

I would like to say a word or two with reference to the question of quarantine. I have advised against quarantining persons of the frequency of carriers and the poor results obtained from quarantining persons. By the time an epidemic occurs carriers have become widespread and are found beyond the boundaries of a single town or county. As a substitute for quarantine I have recommended that authorities advise recent arrivals coming from places where there is an epidemic to use sprays for the nose and throat for the purpose of protecting themselves as well as those with whom they come into intimate contact. Regarding disinfection, it is not unusual to find that people will endeavor to disinfect their houses and beds with sprays of formalin where patients are. This is useless and inefficient. Disinfection should be limited to the discharges coming from the nose and throat of the sick and of those who come in daily contact with them. The discharges should be received in cloths or handkerchiefs and these disinfected by burning or immersion in boiling water. For the rooms free ventilation and sunshine will be sufficient. Bedding and clothing or anything that is in a room may be moved to the open air and exposed to sunshine, which will be ample disinfection. It must be remembered that the organism, or meningococci, has not been found outside the human body; that it has a very low resistance, and will not withstand drying and sunlight.

A printed circular should be sent out in the form of a handbill, which should contain the folowing instructions or information:

(a) The daily use, about three times a day, of an antiseptic spray for the nose and throat. Disinfect the tip of the spray by dipping in boiling water for one minute or more before and after use of the spray.

(b) Careful attention to personal hygiene, mainly cleanliness. Avoid chilling of the body and other depressing influences. Dress to meet the changes in weather.

(c) Avoid close contact with persons. Healthy persons who are carriers may innocently transmit the germs, which may be in their nose and throat, by coughing, sneezing, kissing, talking, etc.

(d) Children should not use articles which may have come in contact with the mouth of others, such as pencils, particles of food, drinking cups, handkerchiefs and the like.

(e) Cleanliness of premises and free ventilation of houses. The germ of this disease has not been found outside of the human body and is easily killed when exposed to drying and sunlight.

(f) The disease is not carried by clothing, merchandise, etc.

(g) Persons suffering with "colds," that is, nasal catarrh, sore throat or coughs, should be careful in the presence of others and should seek early medical attention and relief.

Handkerchiefs wet with discharges from the nose or throat should be disinfected by immersion in boiling water or some antiseptic solution.

Dr. V. H. Bassett, Savannah, Ga.—There were two points raised in Dr. Collins' paper which are worthy of further comment, one of which is the possibility of the infection of the meninges by the gonococcus. It is an organism which has great power of invading tissues of all kinds, producing inflammation of the mucous membranes, and also of serous membranes, such as the peritoneal cavity, and of serous cavities like joint cavities, and even of bone; but up to a year ago, when I reviewed the literature for the purpose, I was unable to find any authenticated case of infection of the meninges by the gonococcus. I think it must undoubtedly occur, but owing to the fact that the meningococcus in smears closely resembles the gonococcus, and also stains somewhat more readily and decolorizes by Gram's method it may not have been differentiated. I would suggest it would be a point of interest to be on the lookout for infection of the meninges by the gonococcus.

A second point is with reference to the difficulty in diagnosis of sporadic cases on account of the fact that very few organisms may be present in the spinal fluid, especially if the physician does not have the fluid examined immediately after its removal. A careful search may show intracellular bodies which have lost their outlines, and there may be difficulty in the determination of the cocci. The difficulty in diagnosis does not rise, as a rule, in epidemics, because there the diagnosis is quite certain if the ordinary symptomatology is observed, and if purulent fluid is obtained by lumbar puncture and you feel assured that you are dealing with a case of cerebrospinal fever; but the sporadic cases may be difficult to differentiate and it may require a very long search and also an immediate search. In such cases the fluid should be sent at once to the laboratory and examined before bacteriolysis occurs.

Dr. Lillian H. South, Bowling Green, Ky.—I would like to report one case in connection with this discussion. Two years ago we received in a diphtheria container a small swab and the doctor who sent it said the tonsils were somewhat congested and that probably a little mucus was deposited on both sides, and we were asked to examine the swab for diphtheria. I made a culture and found meningococci and immediately telegraphed the physician that this was a case of meningitis, or at least meningococci were present. He wrote back that such a thing was impossible, and while I was reading the letter I received a telegram saying, "Please send me some meningitis serum." Through that case there developed 100 cases of the disease in that town, with thirty-five deaths. Three adjoining counties were infected and he told me at the time no other case of meningitis was in that town or county. That child died before it could receive the serum and another child in the same family was seriously ill from meningitis, and I think it is interesting that this diagnosis was made from a swab of cotton in a sterilized container. There is great difficulty in examining the fluid when the physician sends it in an unsterilized container. In that case it is up to the laboratory to make a correct analysis of the case for microorganisms present, and the fluid may be so contaminated that the meningococci will not grow. In these cases I take the fluid and centrifuge it with an electric centrifuge for five minutes; you get a deposit in the bottom of the centrifuge; pipette it and make the differential stain, and if meningococci are present you will find them in a severe case.

It is especially advisable to use sprays, and we give urotropin. All these children received urotropin three times a day and a spray of liquor antisepticus alkalinus. This epidemic I spoke of was difficult to control, and the only trace we had was from the child, and the diagnosis in that case was made from the swab.

Dr. C. C. Bass, New Orleans.—In discussing the paper of Dr. Lyons I should like to call attention to a fundamental principle we are all familiar with in the diagnosis of disease for which we have definite or specific or accurate diagnostic methods. The first thing in the diagnosis of the disease is to suspect its presence. As Dr. Lyons in his paper and in his figures clearly illustrated, the most important of the signs that he mentioned indicate the presence of meningitis, and the most important constant sign was rigidity of the neck. Beyond that there were no other signs that were constant, that were present early and continued; therefore, rigidity of the neck, in the presence of other almost necessary symptoms, which he did not undertake to discover or to mention, is very important. Fever should also be mentioned. Meningitis is accompanied constantly by fever. When a patient has fever with rigidity of the neck, perhaps without other definite explanation or definite diagnosis being apparent, those of themselves are sufficient to cause one to suspect the presence of meningitis. It matters not what else may be done, there is no other examination that can possibly be made that can make definite the diagnosis except lumbar puncture. When we suspect meningitis, or if there is sufficient grounds to suspect it, then a lumbar puncture is indicated. If the patient is anemic, particularly if a boy, and he looks as though he had grown old, we may suspect that he has hookworm disease, and our suspicions will usually be correct, but there is only one way to diagnose hookworm, and that is to examine the stools There is only one way to diagnose definitely men-

ingitis, and that is examination of the cerebro-spinal fluid.

There is another thing that may be brought into use by many without great trouble or inconvenience. Of all the diseases that give rise to fever and are produced by pyogenic bacteria, there is not one that gives rise to more definite, certain and higher leucocytosis in the blood than meningitis. With leucocytocis, fever, rigidity of the neck, in the absence of every other sign, a lumbar puncture is justified or is indicated.

With reference to the question of meningococcus carriers I should raise a question as to whether the opinion held by Dr. Litterer is exactly correct. I should raise a question also as to whether the treatment by sprays, etc., actually reduced the number of meningococcus carriers. I should raise the question whether treatment cures them or whether the meningococcus would have disappeared in a few days without treatment, without the use of the spray, as was illustrated by his figures, and as is well known to all of us in times of epidemics of meningitis, where there is a considerable number of cases in the same section of country there is a very much larger number of people infected or who have meningococci in the nose and throat that do not get meningitis at all. What is the reason? Because of the degree of immunity they possess—is it actually that? Is it not possible that it takes something besides meningococci to produce meningitis? In the first place, may it not take something more than meningococci to produce meningococci carriers? I should rather suspect that is so. It has been pretty definitely shown that meningococci cannot live in saliva, and it is quite doubtful whether they can live in the normal mucus secretions from the air passages; but following an epidemic or occurrence of some influence that gives rise to an epidemic of cold or a free nasal discharge the ordinary normal mucus or free flow of fluid constitutes a fertile soil for meningococci, and then they grow and preponderate, and when such an individual has a free flow of mucus or fluid then his nose is a fertile soil for the cultivation of meningococci; and I question seriously whether any spray can disinfect until such time as that discharge stops, and I question whether any spray would influence the discharge. The fact that following the use of sprays the noses of a large number of patients become sterile of meningococci does not necessarily mean they become sterile because of the spray. What happens with a very large number of cases who get infected and who are meningococci carriers and who do not get any spray? Do they continue to be carriers? They have been disinfected and the meningitis has disappeared. I am not sure also that the influence of trauma or physical force has some influence on the production of the disease in the individual case. For instance, in times when there are no epidemics of meningitis we have occasionally sporadic cases occurring from time to time all over the country. Fully 50 per cent of these will give a history of having fallen or of having been injured in some way. They may have been shaken up a few days before the development of the disease.

Dr. E. C. Thrash, Atlanta, Ga.—I agree with Dr. Bass fully in regard to his statement with reference to carriers. A great barrier in preventive medicine is germ carriers. We must not lose sight of that fact. In spraying the nasal passages or upper air passages the ramifications are such that I think it would be impossible for the treatment to reach all of the parts, and therefore these cases should certainly be isolated the same as cases of diphtheria. We are controlling the active diseases fairly well, but we have not scratched the surface of germ carriers. Tuberculosis, diphtheria, typhoid fever, practically all infectious diseases are disseminated largely by carriers and not so much by the active disease, because hygienics are controlling the active diseases, that is, the clinical types of disease, but we are certainly overlooking the carriers of the endemic or epidemic type. We are beginning now to wake up to the importance of these germ carriers. The use of the spray is not the correct way of handling these cases. It seems to me the correct plan of handling them would be by isolation.

Dr. Stewart R. Roberts, Atlanta, Ga.—We have heard a great deal concerning meningitis in this discussion and the germs thereof, but very little with regard to the methods of doing lumbar puncture. It has been my experience that in the larger cities lumbar puncture is almost regarded in the same class as the operation of laminectomy or appendectomy. As a matter of fact, lumbar puncture is one of the simplest of operations in our limited technic. I have been trying to devise a method of lumbar puncture that would permit the patient to eat or talk or laugh or what not while the operation was going on. If one will take the patient, raise the head of the bed from four to six inches to prevent absorption from the pelvis, or put a pillow lengthwise under the trunk of the patient and transversely under the head in the usual way to get the trunk on a slant to the pelvis below, then flex the legs on the thighs and the thighs on the body, bend the head forward, draw the body up into a knot and draw a line transversely behind from the crest of one ilium to the crest of the other and the spinal interspace, the line that crosses is the point of selection for the puncture. We should employ a Ricord syringe, which is safer and works better, using 1 per cent cocain or alypin solution, injecting first the skin at right angles, pressing the needle in farther until you get up to the tip of the rib. The only thing the patient should feel in doing the lumbar puncture is when you prick the skin with the syringe containing the cocain or alypin solution. The lumbar puncture needle ought not to be less than two millimeters broad and likewise introduced at right angles to the surface in the same place the needle is entered, and that is to be in the median line. If you keep it in the median line it is always safe. It sticks in an inch and a half, and when it slips under the spinous ligament into the spinal canal it goes in readily. Keep it in the median line. If you keep the patient with the body slanted, the fluid comes out without difficulty. The cerebro-spinal fluid is liable to leak. If we put the patient with the head lower than

the hips, obviously we will have some difficulty, and if we adopt the surgeon's idea of elevating the head of the bed and of using this cocain or alypin solution, 1 per cent, one will be tempted to pat himself on the back after the operation. Really, in my experience it has been done with the patient laughing, and when you have finished the patient is surprised you are through and tells you he has not felt a thing except the first prick of the needle.

Dr. L. E. Lafetra, New York City.—I am only sorry the other papers which were down on the program were not read. I have very little to add to the discussion, but there are one or two things I should like to say. In the first place, with regard to the diagnosis, as has been emphasized here so thoroughly, the only way to make an absolute diagnosis is to resort to lumbar puncture, which is not a difficult procedure. I must confess that my patients do not smile and enjoy it, but I hope from what we have just heard perhaps they will change their minds. (Laughter.)

In the matter of diagnosis it has been well said a high leucocytosis and fever, with stiffness of the neck, should make one suspect the disease. There are two other things in which similar conditions occur that are not meningitis. One thing that occurs which will at times disturb the physician who deals with children is pneumonia. Occasionally there is retraction of the neck, a high leucocytosis and fever, with discoverable signs of pneumonia, and the signs may not come out for two or three days. If there is a suspicion of meningitis, a lumbar puncture certainly ought to be made.

Again, certain cases of poliomyelitis will give us fever and at times leucocytosis and stiffness of the neck. These are the cases which have marked sensory symptoms and hypersusceptibility of the nervous system generally. Of course, they are not common cases of spinal paralysis, but the unusual ones which appear in epidemics. Occasionally again we will find otitis media will give some stiffness or some retraction of the neck.

There is another condition, namely, meningism, which occurs in ill-nourished individuals, which gives extreme retraction and stiffness of the neck, but which is not accompanied by fever or leucocytosis.

I would like to add my insistence upon making lumbar puncture whenever meningitis is suspected, and, I think, when men get together to consult, the consultant and the attending physician can do nothing better for the patient and for the community than to insist upon a lumbar puncture being made if there is a suspicion of meningitis.

With regard to the treatment, there has been a great advance by the use of serum. Occasionally, however, we will get a case early, make the diagnosis very early by lumbar puncture, and then we will use the serum in the most approved way and yet be disappointed to see the case going on to a fatal development. These cases are discouraging because we seem to have done everything that the masters of the study of cerebro-spinal meningitis have told us to do. Recently, I think you may have seen the bulletin put out from the Rockefeller Institute by Dr. Flexner, in which he states there are different strains of the meningococci, some of which are resistant to the present serum, and I suppose the explanation of our failures is that we have to deal with a meningitis which is due to one of these resistant strains. It is to be hoped that there may be a developed polyvalent serum made which will perhaps be efficacious against even these resistant strains.

Another important matter is that occasionally we find relapse in cerebro-spinal meningitis, and we must not be discouraged. I have had two such cases within the last year in which the cell count became low, the meningococci disappeared from the free fluid, and then after an interval the serum treatment having been kept up for a time and then discontinued, with improvement in the symptoms, but there was after an interval a return of the symptoms and a return in the spinal fluid of an increased number of cells and of meningococci. The serum used again in these cases proved efficacious and the children made a satisfactory recovery, so that we have our discouragements on the one hand in the way of these cases that do not improve with the symptoms, and on the other hand those, when they have relapses, that will recover entirely.

Dr. D. M. Molloy, Manila, Philippine Islands.—While I have had no personal experience with meningitis, I have had a rather large experience with lumbar puncture, and while I agree with everything Dr. Roberts has said respecting lumbar puncture, with one single exception, I wish to call the attention of this association to that exception. Dr. Roberts advocated the use of cocain in doing lumbar puncture. Now, we all know that it is practically impossible to sterilize a solution of cocain, and I wish to call attention to the use of this unsterile fluid in the field of your operation. You introduce cocain under the skin at the site at which you introduce the needle; he advocates carrying the needle in the same track through tissue, expecting to introduce the needle into the spinal canal. Gentlemen, there are dangers underlying that, and I think they should certainly be taken into account when we make a lumbar puncture. We should certainly take into account the fact that if there is not already an organism present, there is great danger of introducing one, and I simply want to call the attention of the association to that one thing, the danger of using cocain solution, which in the great majority of cases is not sterile, into the operative field, and introducing some infectious material into the spinal canal and thus endangering the life of the patient.

Dr. L. W. Elias, Asheville, N. C.—I wish to speak of one point in connection with the treatment of meningitis. We give the anti-meningitis serum to cure this disease; but what is the indication that we have given it long enough and may discontinue the injections? The classical directions are to give one dose each day for four days, and if the case improves then discontinue the serum and watch and wait. Other directions—and they seem to me much more accurate—are to give the serum until the spinal fluid is free from germs. For, regardless of the symptoms, as long as there are any germs present, we cannot be sure that further damage may not occur.

A case illustrating this point is the following: A little darkey boy, six years old, with all the symptoms of meningitis present to a marked degree, and he apparently in a hopeless condition. After four doses of serum in three days his mind cleared, his pain and fever practically left, he talked rationally, laughed and seemed almost well, save a slight fever and the rigidity. Two more doses of serum were given and he seemed so well that it seemed useless, and almost a pity to continue the injections. The spinal fluid had cleared up, but a few germs were still present in it. Serum was discontinued and he made what seemed to be an uninterrupted recovery. Two months later he was found playing about the yard, fat, lively and happy. The mother said that he was in good health, but on examination it was found that he was entirely deaf in one ear, that one leg was a little weaker than the other, causing a slight limp, and his mother had had to buy tin dishes for him to eat out of, since he was inclined to drop and break everything which he picked up—all the finer movements of the hands seemed lost. Although this case was apparently cured, yet he did not have the full recovery that we look for in cases treated with the serum. It seems to me in this case that if we had continued the treatment until the spinal fluid was free from germs the little fellow might have made a complete recovery.

Dr. C. C. McLean, Birmingham, Ala.—One important condition to be considered in the treatment of meningitis is sudden death from the injection of serum.

I have seen two deaths from this cause. These lives might have been saved had proper precautions been taken.

Many suggestions have been made as to the cause of death in these cases, such as anaphylaxis, phenol poisoning, etc.

Flexner and Cushing believe death is due to intercranial pressure. No doubt this is true. Sophian, of New York, advises that blood pressure be taken before and during injection of serum.

At the Babies' Hospital the following technic was used as a routine, and since leaving that institution I have continued to use it. A rubber tube is attached to needle. Blood pressure is taken before removal of fluid, during removal of fluid, and on the injection of serum. The serum is allowed to run into spinal canal by gravity, as soon as the blood pressure begins to fall, the injection of serum is discontinued, some is allowed to escape.

After injection of serum clamp rubber tube with a hemostat and needle is left in canal for thirty minutes. Blood pressure being constantly taken if the pressure begins to fall some of serum is allowed to escape.

Patients should never be pronounced cured of a meningococcus meningitis until three negative cultures have been made from the spinal fluid. If these precautions be carried out there would be fewer relapses and complications.

In the treatment of chronic meningococcus carriers I would suggest the use of sprays of meningicoccus serum.

Dr. J. Ivimey Dowling, Albany, N. Y.—One of the essayists spoke of trauma as an exciting cause of cerebro-spinal meningitis. I have had two such positive cases, and although not of the epidemic variety, still I would like to cite them in order to emphasize the fact that during such epidemics intra-nasal operations might prove more dangerous than at other times, for the nose is the portal of entry for a variety of infections, the germs of which may gain access to the ethmoid cells and remain dormant until after some operative interference.

Both of these cases were instances of cerebro-spinal meningitis excited after operations performed by myself. Both stood the operations without immediate shock, but within a few hours they complained of pain in the ear and rigidity of the neck. Upon the advent of these symptoms I had lumbar puncture performed and the report in each instance was pneumococcus infection.

Ballinger has made the statement that in those cases which result from operation there has been a pre-existing meningitis. Perhaps this is so, but in any event I cite these cases to emphasize the fact that this is one of the things which the nose specialist has to face and for which he should not be condemned in the event of his patient suffering from cerebro-spinal meningitis subsequent to operation.

Dr. Arthur T. McCormack, Bowling Green, Ky.—We have had a considerable number of cases of cerebro-spinal meningitis in Kentucky, and, through the courtesy of the United States Public Health Service, we called in Dr. Von Ezdorf, who advised such simple methods for our adoption that they were appreciated by everybody in the communities affected. We have been able to actually control epidemics with a small spread of the disease, and I hope very much that Dr. Von Ezdorf, in closing the discussion, will be given sufficient time to lay these methods before us.

I want to speak especially as regards a very slight practical difference between Dr. Litterer and Dr. Bass in regard to spraying the nose and throat. During the epidemic in Maysville the schools were kept in session and parents were urged to keep children in school. Each morning, under the supervision of the health officer and volunteer local physicians, the teachers were taught how to spray tne noses and throats of the children. In no child whose nose and throat were sprayed did the disease develop. The children of one man who refused to have their noses and throats sprayed developed the disease, but no other case occurred in the school. There were thirty-five cases of the disease in children. The disease occurred in children whose noses and throats were not sprayed, and as a practical matter in Kentucky we shall insist that the teachers be taught how to use the sterilized nasal tips as they were used in schools in Mason County, where we have an unusual set of clever teachers under one of our greatest school superintendents. We shall insist not only on other preventive measures being carried forward, but on the use of the spray by every individual who has sufficient intelligence to be taught to use the spray properly. No measure can be condemned because it is used by the ignorant or incompetent badly. If that were the case, all our methods of procedure, especially in surgery, would be condemned too frequently.

I hope very much, Mr. Chairman, Dr. Von Ezdorf

will be given the opportunity to set forth the simple rules he has formulated, which we have published in Kentucky, not only in our bulletins of the State Board of Health and in the Kentucky Medical Journal, but they have been scattered in the lay press in such a way that they have come into the hands of every individual in the infected communities. We are indebted to Dr. Von Ezdorf for the decrease in both the mortality and incidence of meningitis in Kentucky.

Dr. Henry Hanson, Jacksonville, Fla.—There were one or two points which attracted my attention in connection with Dr. Litterer's paper, and one of these was the mention made of using autogenous vaccines in some of these meningococcus carriers, and the number of cures or the number of cases that cleared up after the use of such vaccines. He only reported two cases out of the series as having cleared up after the use of autogenous vaccines. The opinion of a great many men, some very good men, and Theobald Smith is one of them, is that autogenous vaccines are not of a great deal of benefit in carrier cases. These men hold to the idea that a carrier case as a rule is immune to the organism, and that it is not an illogical conclusion to reach, as we know that a great many of these carrier cases are simply mechanical carriers, and the organisms are not very definitely lodged, or you may say, very closely associated with the circulation of that individual, and it would be very interesting at least, if not unusual, to find a vaccine to be very efficacious in cases of this kind.

Another point which has to be considered in such cases is the matter of virulence of organisms in carrier cases. There is a great deal of need for people dealing with infectious organisms at this time to remember they must hold a proper balance in dealing with cases of this kind. One must not go to extremes, too far in one direction or the other. We should not make too rigid rules and regulations for their quarantine, or, on the other hand, we should not neglect the importance of these cases. There is no doubt that a great many of them are of considerable importance to the people at large, and a few of them may be important to the individual carrying them in that possibly he may devel p infection at some time when his physical condition is below par. But so far as the individual carrier is concerned, I do not believe that he himself is in very great danger from the presence of these organisms. The virulence of the organism found in carrier cases should be tested by inoculating guinea pigs, and the carriers of virulent organisms isolated and treated by proper methods for eradicating such organisms.

Dr. C. E. Terry, Jacksonville, Fla.—I particularly wished to have Dr. Litterer present, as I want to ask him some questions in regard to the matter Dr. Hanson spoke of.

Dr. Thrash made the statement in regard to the handling of the carrier proposition which in my opinion was a very timely remark, namely, that we have only just begun to scratch the surface of the carrier as a disseminator of disease. We have recently had in Jacksonville a small epidemic of diphtheria, and some four months ago we began to handle these cases in a way different from what has been our custom in the past. We started making a search for carriers whenever a case was reported from a home. We took swabs from every member of the family and servants in the house and segregated the carriers from the non-carriers. We explained to the family as well as we could what a carrier was, how a carrier is formed, and warned them that association of the non-carriers with the carriers might result in the non-carriers becoming carriers at the time the original carriers themselves had cleared up and the quarantine thus be prolonged.

We have found no inconsiderable number of carriers. The work is too new to draw any conclusions, but we have at least found out that wherever we have had diphtheria in a neighborhood the proportion of carriers found in that neighborhood has far exceeded the proportion of carriers found from schoolroom swabs where diphtheria was not present in the neighborhood, and presumably the carriers found under these circumstances are virulent. That brings up the point of the practical side of the chronic carrier. The laboratory is constantly getting the health officer into trouble. The laboratory diagnoses are reliable and the laboratory methods have advanced more rapidly than the methods of handling these findings from the executive department of the health office.

The doctor spoke of two meningococcus carriers which lasted six months. He did not say what he did with them in the schools, and the practical question occurs, if you quarantine the carrier, whether the case be one of diphtheria or meningitis, if he happens to be the breadwinner of the family, what does the community do to care for that carrier? Is the income of the carrier to be cut off for the protection of the public health or is the community to make some provision? It is a practical matter of extreme importance. We have not had any carriers of any great duration. Three or four weeks has been the longest, but in some of these cases it has been a distinct hardship for the family to be quarantined. In many families a number of individuals are bread-winners and are healthy, so they are quarantined. I quarantined one home where their means of livelihood depended upon taking in sewing, the mother and several daughters thus supported the family. However, the quarantine did not last long. If it had, I do not know what I should have done, as no provision had been made for caring for these cases in our community.

In connection with the meningitis carriers of long duration, is there not a great probability that the nasal mucosa and the mouths are invaded by the infection having gotten into the nasal sinuses, and is it not probable that the washing out and draining of the ethmoid and frontal sinuses, the mastoid sinuses, etc., might materially shorten the period of carriage? I believe it is a matter which deserves investigation. The carrier question is unquestionably a most important one in regard to the prevention of and dissemination of disease. It is of the utmost importance that we should determine the virulence of the organism by some quick method, particularly in cases of diphtheria and meningitis. The practical application of the handling of the carrier in communities is a matter to me of the very greatest importance, and one which has not come up for discussion in con-

nection with these papers or a matter about which I have seen or read very little; yet with the growing importance of the carrier in different diseases we are going to have this problem presented in a disagreeable and forcible manner. The quarantining of the chronic carrier is illogical, and I believe all quarantine is more or less illogical when it comes to the carrier proposition.

Dr. Randolph Lyons, New Orleans (closing discussion).—Dr. Roberts has told you of his method of entering the spinal canal. He says to have the patient lying on his side with the body doubled up in a knot, so to speak; then introduce the needle in the median line at the level of the iliac crests. The modification of the technic of lumbar puncture that I suggested in my paper was not intended for patients whose backs can be flexed, but on the contrary, for those in which orthotonus exists. Under these conditions, anatomically, the spinous processes approximate each other closely. It would, therefore, be a difficult matter in most instances to perform the puncture in the median line—clearly we should introduce the needle a little to one side of the median line. My second point is that under similar circumstances (where the spine cannot be flexed) if the needle be inserted at an acute angle (pointing markedly upward towards the head) a little toward the median line and more deeply than usual like this (illustrating), the spinal fluid will often be easily obtained. The reason for this is that when the spine is in extension, the opening into the canal in a markedly upward direction is considerably larger than in a horizontal direction which is approximately the course of the needle in a classical puncture. These facts can be easily verified on the skeleton or cadaver.

I agree with Dr. Molloy that cocain is unnecessary. There are a certain number of cases that resist and struggle against anything that is done to them, whether painful or not. Such patients should be given a general anesthetic, for their exertions will do far more harm than the anesthetic.

Dr. Bass, in his remarks, has brought out the importance of fever and leucocytosis with the rigidity of the neck. I fully agree with him and regret that, owing to the fact that my paper was limited to signs, I could not take up symptoms. In the adult I would add to the symptoms mentioned, headache and Kernig's sign. I have not seen a case that did not give a history of headache. The pain may be frontal (often at first), occipital, or still lower in the neck.

I have seen three cases that were practically afebrile, one very mild and two fulminating.

Dr. William Litterer, Nashville, Tenn. (closing the discussion).—I believe to abolish the spray in our fight against cerebro-spinal meningitis is very bad teaching. I specifically stated in my paper that the spray played little part in eliminating the carrier, and I will agree with Dr. Bass to that extent, but I do not agree with him to the extent that it will not prevent infection to others. It has been shown practically, as well as scientifically, that sprays do an enormous amount of good. The spray has proven its worth in the epidemic related by Dr. McCormack. Likewise it was of inestimable value in the epidemic at the Tennessee Industrial School. In this epidemic carriers were isolated and the spray was given every three or four hours. Probably some carriers were overlooked, so the spray was advised to every individual supposed to have been in contact with a case or carrier. The spray does good in two ways: first, it gets rid of an enormous number of meningococci. This lessens infection to others, such as in sneezing, coughing, etc. Second, it prevents auto infection. Our experiments conclusively show that a few hours after the use of the spray that no meningococci could be culturally demonstrated in the throat and nose. Such an individual is temporarily rendered harmless. Another spray is used several hours later which again renders the person free from infecting others.

Just a word concerning the clear fluid from lumbar puncture. Of the twenty-one cases in the Tennessee Industrial School there were three cases in which there was obtained on first puncture absolutely clear fluid, no leucocytes or anything that you could tell that they had meningitis; but on second puncture there were easily demonstrated intracelluiar meningococci and pus cells. In two cases that were examined there was an increase in the amount of globulins in the fluid, and a diminution in the alkalinity. I have not had experience enough in this test to know whether or not it can be depended upon. In every case where there was a suspicion of a meningeal trouble the serum was administered. A few cases proved not to be meningitis, but no harm resulted in the giving of the serum.

Dr. Terry.—I would like to ask Dr. Litterer what became of these two six months' carriers? How did you handle them?

Dr. Litterer.—They were isolated in the Tennessee Industrial School.

Dr. Terry.—They were not bread-winners?

Dr. Litterer.—They were children, and this school keeps them until they are about 21 years of age.

Dr. Terry.—It was not a question in practical quarantine?

Dr. Litterer.—No; they were kept at the school.

SOME GENERAL OBSERVATIONS ON CEREBRO-SPINAL MENINGITIS WITH REPORT OF A CASE TREATED BY INTRODUCING SERUM INTO THE LATERAL VENTRICLE.*

By R. V. Martin, M.D.,
Savannah, Ga.

Prior to 1906 very little was known about the epidemiology of cerebro-spinal meningitis; since that time so much has been accomplished through the assistance of pathologists and bacteriologists that the medical world has been very greatly enlightened, and the possibility of effecting cures and stamping out epedimics rendered much more certain.

The first step in this direction was made by determining the causative agent and its habitat—on this we are all agreed. The next important step about which we are not all agreed is its mode of entrance into the meninges. At present there is a diversity of opinions as to how this takes place.

King, of New Orleans, in the *American Medical Journal,* February, 10, 1912, has written very interestingly on this subject. Assuming that the habitat of the diplococcus intracellularis meningitis is in the nasal and buccal cavities, some are of the opinion that entrance is made by direct extension; others claim that entrance is made by means of the lymphatics of the intestinal tract. The third view taken is that entrance is made by means of the blood. I have not settled in my own mind how this is accomplished, but am inclined to the last view.

Aside from the interest in the treatment of those who have contracted the disease, the condition that appeals to us most is the control of the epidemic.

A study of the recent epidemics both here and in Texas has taught us much of interest.

1. That no case could be traced directly to another as its source of origin.

2. That the disease was confined to no one locality, though insanitary conditions contributed largely to its existence.

3. That quarantine was useless and unscientific, isolation was very effective.

4. That the germ was carried through the medium of a healthy carrier.

Personal hygiene is of the greatest importance, and undoubtedly serves as a preventive. The greatest care should be exercised to see that the nasal and buccal cavities of those exposed are carefully cleansed—not on the theory that it renders them immune—and this should be thoroughly impressed on the parents of the little ones that they might not be lulled into a sense of false security by the use of these simple remedies, but as a means of prophylaxsis. Krulish opposes the use of the nasal spray on such occasions, on the theory that its use is of little benefit—and may prove injurious to the delicate mucous membranes with which it comes in contact, and that other more important measures may be overlooked.

Hall reports that of the number of cases examined by him, 77.7 per cent showed an acid blood, and suggests that it would be wise to alkalinize the blood of those exposed, as such a condition would be unfavorable to the existence of the germ in the blood. This suggestion is well worthy of consideration.

Individual susceptibility and fear of the disease is an important factor in its development.

A case of meningitis was sent to a local hospital. The supervising nurse evinced much fear when she learned she had such a case on her floor, and stated at the time she feared she would contract the disease. Although her duties were those of general supervision, having nothing to do with the nursing and care of the patient, she developed the disease in its most malignant form and died.

Another case of some interest occurred in a

*Read by title in Section on Medicine, Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

nurse on a private case in the city. After remaining on duty two or three days she telephoned me about 3 a. m. that she was quite sick and feared she had contracted the disease. I found her greatly frightened and complaining of severe headache, stiffness of the muscles of neck, but no fever. Having in mind the other case, I relieved her from duty and determined that she had evidently developed a pseudo-meningitis. I feel satisfied that had she remained on the case she would have developed the disease in its true form.

The case I wish to report was treated by puncture of the left lateral ventricle, drainage and introduction of Flexner's serum into same, occurred in a boy nineteen years old living in Savannah; was admitted into the hospital on the 23d of March, 1911, stating that he had had the disease several days. Temperature on admission was 101, pulse 100, stiffness in muscles of neck, intense headache, and Kernig's sign was present. A lumbar puncture revealed purulent fluid which was found to contain diplococcus intracellularis meningitis. After drawing off some of the fluid, the usual amount of serum was injected into the canal, and during the succeeding twenty-two days ten injections were given. After each injection there was a temporary improvement in his general condition, the severity of the headache was only slightly improved. His temperature ran from normal to 103, mental condition gradually becoming more and more impaired, eyesight was failing him. On the twelfth day of the treatment he lapsed into a mild coma, and was steadily losing weight; a general rigidity became very marked. The spinal fluid varied considerably in consistency, and at times it was fairly clear. His pulse remained fast.

It was while he was in this apathetic condition that I determined to trephine his skull, and treat him as above stated. Accordingly, his skull was opened at a point in front of the bregma, two c. m. from the midline, inserting the hollow needle downward and slightly backward about five c. m., when the ing under pressure, was allowed to escape until it ceased flowing through the needle, then the usual dose of serum was introduced into the ventricle. A drain was inserted down to the dura, and wound closed in the usual way.

The effect of this operation was very marked, his condition began to clear up immediately, temperature ran from subnormal to normal, and within two weeks after the operation he was discharged from the hospital pronounced cured. I saw him once since he left the institution, and at that time he was enjoying good health.

The puncture of a distended ventricle is a comparatively easy operation, and the surgeon should not hesitate where there are symptoms of blocking of the so-called foramen of Magendie.

I regret that I have only this one case to report, but I am convinced that if, after careful routine treatment has been administered to the spinal canal and symptoms of pressure are still present, that resorting to this treatment will reduce the mortality of this disease.

TUBERCULOSIS: INTESTINAL PLANTING IN CHILDHOD; LUNG HARVESTING LATER.*

By E. C. Thrash, M.D.,
Atlanta, Ga.

But little thought has been given to other modes of infection in tuberculosis except that it is an air borne and an inspiration disease. Until we get away from this idea and begin to study the mode of infection scientifically and from different angles, we will make but little progress in checking the ravages of this malady.

The object of the writer is to show that tuberculosis is as certainly an alimentary disease primarily as is typhoid fever. This is

*Read in Section on Medicine of tne Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

cavity was readily reached, and the fluid be- such a wide departure from the beaten paths that such a statement for a long time yet will not be generally accepted as true, even though it may be definitely proven. It is the exception and not the rule that tuberculosis is produced in any other way except by the ingestion of tubercle bacilli, although the reverse of this is what we have thought to be the case in the past. The germs of tuberculosis do not undergo segmentation singly, and separate from each other in liquid culture media, thereby filling these media with individual germs, as do most other pathogenic organisms, but they will grow only in clumps or clusters either upon solid medium or floating upon the top of liquid. Not only is this true, but they must be kept completely at rest for two or three weeks before growth will begin at all. Conditions that will give them this rest do not exist in the respiratory tract; they are kept constantly in motion by the cilia from the time they enter the tract until they are finally thrown out; or, in case they should get by these defenses and find lodgment in the vesicles beyond the cilia, the antibodies, including the phagocytic action of the cells, would destroy single organisms long before they would have time to rear a family, as they would have to build for themselves suitable surroundings, including barricades in the form of tubercles, upon this mucosa before they could begin propagation. Certainly, ere these germs would lie there for one or two weeks surrounded by phagocytes (endothelial cells of the capillaries, epithelial cells of the air vesicles, and white blood cells), some of the huskier ones would overcome them and carry them to deeper structures, although the successful cell might die in the act and leave the crippled germ to be disposed of by the lymphatics. In other words, a tubercle bacillus could not live upon the mucosa of the lung for a period of ten or fifteen days, until it could surround itself with proper environments for growth before the sweeping methods of the cilia, phagocytic action of the cells, and bacteriolytic action of the body fluids would have time to destroy it completely. This germ cannot propagate by segmentation while being moved from place to place by the body tissues, but must remain quiet sufficiently long for the tubercle to form, the histological structure of which is complex and of slow growth. We must keep this fact constantly in mind in studying the pathogenesis of tuberculosis.

For many years this malady was thought of as a hereditary disease, and this was later dismissed, and the inspiration method has since been enthusiastically advocated. The time has arrived now when we must condemn the latter as emphatically as we have already condemned the former. It is only remotely possible that tuberculosis can even be a prenatal infection. This is not possible except when the placenta becomes tuberculous, and the tuberculous material erodes its way into the chorionic villi, entering the veins of these villi, and in this way disseminates germs into the foetus. Syphilis is more easily a prenatal disease than tuberculosis from the fact that the spirochetes are motile, spiral, and propagate by segmentation while being scattered through the body by circulating fluids. Their motility and spirility enable them to pass through the villi into the foetal veins, find lodgement in the liver where they meet the first capillary circulation, and set up infection in this organ. This mode of passage of the spirochete from the mother to the foetus is, in a measure, proven by the fact that practically all cases of prenatal syphilis develop primarily in the liver, where they meet their first obstruction. I mention this because the trend of my argument is going to be to show that the germs which we are now considering find their opportunity for development only after they have been driven into arterioles or capillaries as emboli, and have plugged these vessels up.

The foregoing has prepared us now to take up the discussion of how these bacilli pass through the walls of the alimentary canal. Aqueous suspensions of tubercle bacilli in-

jected into the rectum of calves and other animals invariably pass out promptly without producing infections. Why should not they find lodgment there and grow just as we suppose they do in the lungs when they are inhaled? When these same bacilli are suspended in an oleaginous emulsion, or milk, with its normal cream content, infections follow. This is one of the most valuable bits of knowledge that we have learned in regard to phthisiogenesis in recent years. Intestinal villi of the alimentary tract will not take up any substances except emulsified or saponified fats. The tubercle bacilli being suspended in these fats are taken up while incorporated in them, and are carried into the lacteals. None of them pass out of the alimentary tract through the blood vessels; if so the aqueous solutions of them would be taken up. At the time of their entrance into the villi these germs are not in clumps, and do not have the proper surroundings to grow, but through this route they soon reach suitable environments. The lacteals, as we know, are a part of the lymphatic circulation, and the lymphatics, studded everywhere with glands, finally empty into the venous circulation. The natural course for these germs to take would be that of the lymph, so they pass along the lymph channels, either lodging in the glands where they may, or may not, produce infections, or they make their way through these glands into the veins. If the glands do become infected the pathological process may progress to caseation and complete degeneration, or the immunizing processes may restore them to health. Should the breaking down take place in the peritoneal cavity the tuberculous material may find lodgment in the large lymph spaces of this organ and produce tubercular peritonitis. If it takes place without this cavity the material is taken up by other lymphatics, and the process above mentioned is repeated.

My experience in handling large numbers of children of tuberculous parents at the Atlanta Tuberculosis Association has been that practically all of them have tubercular adenitis, and are positive to the Moro and Von Pirquet test, showing that they have become infected from their parents, but I rarely find one with lung involvement. Also, most of the children which I have examined post-mortem at Grady Hospital that have died of chronic, wasting diseases due to disturbances of nutrition have shown tubercular infections in the lymphatic glands of the abdomen, with normal lungs.

A lymphatic gland contains most of the prerequisites for the formation of a tubercle—that is, it contains a mass of lymphocytes encapsulated and divided in clusters by bands of connective tissue. The function of the cells of this gland is more to barricade against bacteria than to disintegrate them, as lymphocytes are not primarily phagocytes. Therefore, the progress of the tubercle bacilli is checked within the gland structure, surrounded with these cells, and they here have the opportunity of forming tuberculoid areas in which the environment for development is similar to that of a tubercle. These glands in children contain less fibrous tissues, and are more loosely constructed, so the bacteria have better opportunities to pass through them and finally reach the venous circulation than they do in adult life. When they reach the venous circulation the next capillary vessels which they reach are in the lungs. There is less fibrous tissue in the lung structure of the child, the capillary vessels lie more loosely between the air vesicles and are more dilatable, therefore, the germs pass more readily through them into the arterial system, but, in order for these germs to find suitable conditions for growth, they must reach a point where they will be at rest. These localities are in areas where there are terminal vessels, and especially where these terminal vessels have their power of dilating interfered with, as in the metaphyses of the long bones and spinal vertebrae. So, we have tuberculosis in children quite frequently in the joints due to the infection starting in these met-

aphyses and spreading to surrounding parts, though other organs with terminal vessels, as meninges, brain, liver, spleen, and kidneys may also become involved. When the bacilli reach localities where they begin producing tubercles they do so by driving themselves into the arterioles or capillaries as emboli and producing microscopic infarcts. These infarcts are either dead or are much weakened structures which possess little or no resistance, and the clumps of bacteria are undisturbed for a sufficiently long period of time to get a foothold that enables them to develop tuberculous deposits. The metaphyses possess blood vessels which are not only terminals, but are surrounded by bony and cartilaginous structures, which structures prevent them distending to a sufficient degree to allow these bacteria clumps to pass through into the veins, and the microscopic embolic material which they produce here safeguards them against active antibodies while they are laying the foundation for growth. Just such a process takes place between the air cells in later life, as constriction of the capillaries by fibrous tissue infiltration in this area produces similar conditions. In other areas of the body where the bacteria do not find such ideal environments they may pass out between the endothelial cells of the capillaries into the lymph spaces, find lodgment in the lymphatic glands, and in this way set up a further lymphadenitis. The child usually shows a disposition to establish an immunity against these germs, in which case they are either entirely eliminated from the body structures, leaving the child well, or they may lie dormant for an indefinite period. If the latter condition prevails the lowering of resistance later in life may establish an activity. This is the time when the lungs become jeopardized. The structures between the air vesicles become more fibrous and compact, the distention of the air cells impinges upon the intervening capillaries, and the blood vessels themselves become stiffer as one grows older; the expansion of the arterioles and capillaries on this account are restricted; therefore, when tuberculous material, consisting of debris, caseations and bacilli from infected glands or degenerated tubercles in other areas, finds its way into the veins, principally through the lymphatics, it lodges in the restricted capillaries between the air cells. Here the same type of infarct is produced as is formed earlier in life in other organs, tubercles develop and the result is pulmonary tuberculosis. The reason that the apex of the lungs is most often affected is that tuberculous material, including the germs, contains much fat, and the specific gravity is lighter than that of the blood, it, therefore, rises to the highest point, which is the apex in the human. In the cow the caudal appendage of the lung is the highest part, and it is first affected in this animal. The tissues lying between the air cells in infancy and early childhood are of such structure the blood vessels have more freedom, and the vessels themselves are more dilatable, is why infarcts followed by tubercles, are so much less apt to form here at this period than later in life.

It is not the intention of the essayist to attempt to show that pulmonary tuberculosis in adults is produced exclusively from infections in early life, or that the disease can develop only in adults, for adults can become infected by ingesting the bacteria, just as children may, and children may get a primary lung infection after ingesting the germs and not have tuberculosis of other organs. What he does wish to emphasize is that observation, experience and experimentation all point directly toward the method herein described being the rule, and other modes of infections the exception.

THE DISTINCTION BETWEEN AN INFECTION BY TUBERCLE BACILLI AND TUBERCULOSIS.*

By Mary E. Lapham, M.D.,
Highlands, N. C.

The purpose of this paper is to urge the appointment of a Scientific Commission to determine whether the work now being done in European laboratories is worthy of imitation in the United States. I especially wish to call attention to the necessity of establishing the relationship or the non-relationship of acid-fast bacilli to the tuberculosis of man, as suggested by Van Calcar, of Leiden. Second, to the possibility that the tubercle bacillus of mankind may have a residence and be transmitted outside of the human body in forms not yet recognized or sought for, as suggested by Much, Deycke, Kennerknecht, and others. Third, the possibility that the tubercle bacillus, as we know it, is the product of a complicated series of adaptations between the agent of attack and the defensive mechanisms of the host. The properties of a tubercle bacillus are originally neither acid-fast nor parasitic, but the attack is initiated by a common saprophyte of the intestinal tract closely related to the colityphoid group. Ferran has been working for twenty years inducing typical tuberculosis in guinea pigs by using pure cultures of these saprophytes that will grow almost anyway on almost any media. These saprophytes are universally distributed throughout nature, and growing under the most diverse conditions have acquired many superficial distinctions while retaining their common fundamental characteristic of developing into tubercle bacilli and causing tubercle formation. The infection by these saprophytes develops chemical forces in the host that demand a change in the chemical forces of the foe if they are to survive. Gradually one chemical factor after another is altered or added until the saprophytes, either aerobic or anaerobic, assume a neutral fat, a fatty alcohol and finally a fatty acid, changing while so doing from a common gram positive saprophyte to an obligate, aerobic parasite, protected by a fatty acid covering constituting the so-called acid-fast bacillus of Koch.

This attack and defense is begun in the intestines, and the whole system is gradually sensitized. Later on, as these altered bacilli enter the blood stream, they are swept along by it and excreted by the liver so that no harm is done unless they are deposited in the tissues and become aggressive. The profound changes in the infectious agent bear witness to the complicated nature of the reactions, of the long chain of cause and effect, so that we can neither speak of the tubercle bacillus nor of tuberculosis as an entity, since there are many tubercle bacilli and an infinite series of diseased conditions. Tuberculosis is a fabric, representing the constant weaving of one set of conditions into another, so that in no stage can we say this or that antigen or antibody is characteristic. Today we have one problem, tomorrow another. Today one kind of attack and defense, tomorrow both are changed, so that the disease we regard as a clinical entity is rather an imbrication, a piling up of causes and effects into a complicated agglomeration composed of an inextricable mass of indistinguishable antigens and antibodies, persistent or surviving only in their reciprocal effects.

What are the scientific facts supporting these hypotheses? Let us first consider the relationship of acid-fast bacilli to the tuberculosis of man. We know that acid-fast bacilli grow everywhere, from one end of the world to the other, on the leaves of trees, on the grasses and mosses, in slimy masses, in running water, and under the most varied conditions of aqueous existence. They are so universally present that laboratory workers

*Read in Section on Medicine of Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

have great difficulty in keeping them out of distilled water. We also find them in the lower animals, in frogs and snakes, lizards, turtles, fish, etc., and we also find that now and then their presence is associated with tubercle formation. In birds, chickens, etc., there is the same association of cause and effect, and also in pigs, sheep, cats, dogs, cows and man. *Wherever we find tubercle formation, there we find acid-fast bacilli.* These differ in cultural characteristics, but it is possible that we have narrowed and confined our vision to laboratory technique, and not seen the force of biological characteristics. We find that any extract, or tuberculin as we call it, made from any acid-fast strain, whether vegetative or animal, causes precipitins and agglutinins in any animal infected by any kind of acid-fast bacilli. The complement fixation test easily distinguishes this family from all others, but is powerless to effect a group differentiation. Tuberculosis is the only disease common to warm and cold-blooded animals, and is therefore the most universally distributed throughout the animal kingdom. We know that as a rule a specific cause is restricted to a very limited number of species. The boll weevil does not attack corn, nor the phylloxera apples; nor does anthrax attack snakes, or tetanus frogs. What shall we say when we find the same disease under more varied conditions than any other? Shall we say, since the tubercle is the same and its cause is always an acid-fast bacillus, that all tubercle formation in all animals must be the common expression of a common cause? Or shall we, because of laboratory efforts, blind ourselves to this patent fact and say: "No! The tubercle bacillus of a frog has no relationship to that of a toad or turtle; and each species, whether man, cow, pig, lizard, or bird, transmits by a sort of sealed transmission its tuberculous agent from host to host with no relationship whatever to any other tubercle bacilli?" Is it not more reasonable to infer that the universal phenomenon of tuberculosis of animals is perpetuated because of the universal presence of tubercle forming, acid-fast bacilli in the food they eat, the water they drink, the air they breathe, so that the ingestion and excretion of these bacilli is part and parcel of the ordinary phenomena of existence? We have a universal result, universally associated with the presence of acid-fast bacilli. Is there any reason why, when the result is always the same, we should make the number of causes equal the number of distinct and separate manifestations? The reason for this attempt is based upon the belief in the immutability of the infectious organism. This immutability is supposed to be a proof that its derivation and perpetuation proceeds in a strict line from host to host of the same species, and the fact that we cannot induce tuberculosis in turtles by bovine or human bacilli or vice versa is supposed to prove beyond all question the impossibility of transcending the strict lines of descent. Once a turtle bacillus always a turtle bacillus.

Admitting this to be true, it is still possible that the perpetuation of infection constantly proceeds from a parent source, and that this original source of supply for all the forms of animal life, from the lowest to the highest, may still furnish infection to all by differentiation accomplished by the host. The presence of acid-fast bacilli in hay, grasses, and water suggests the possibility of a persistent infection of the cow, and persistent excretion through feces and milk as a perfectly normal phenomenon. We rid our herds of tuberculous cows, but can we ever guard against this constantly occurring and usually harmless infection by food?

The German government estimates that two hundred thousand children in Germany have bovine tuberculosis. According to these statistics, we should have from three to four hundred thousand. Here we have an instance of tuberculosis, not due to sealed transmission or exclusive residence in man, and four hundred thousand children in the United States

that cannot be protected by segregation or quarantine measures and are not included in our common efforts to obliterate tuberculosis. Here is one class of tuberculosis cases due to transmission by food, both to the cow and to the child. Shall we attempt to sterilize the food and drink and air of these cows, or acknowledge the impossibility of preventing their infection and endeavor to protect our children by sterilizing the milk? If so, we must sterilize butter and cheese also.

Since our work for obliterating tuberculosis depends upon the immutability of tubercle bacilli, we should be perfectly certain that this is a true dogma. Are tubercle bacilli immutable, or are they so extraordinarily capable of mutation as a means of adaptation that they might serve for fundamental principles of evolution and confirm Lamarck and Darwin and deVries?

What is the variability of our own bacillus? Grown in cold-blooded animals it changes its optimum temperature promptly to that of its host. Grown as a homogenous culture, it loses its agglutinating tendencies. Moreover, the different strains of human tubercle bacilli are as different as the different hosts furnishing them. Broadly speaking, no two strains of human tubercle bacilli are alike in their molecular arrangements, and their protein constituents are so variable that tests proving true in France for the French people are not as equally true in Germany for German people. An Arloing homogeneous culture from Paris will not give as true biological reactions in Hamburg as a culture made from the timothy bacillus of the fields of the neighborhood. The tubercle bacilli of one country are more intimately related to the inhabitants of their country than any other, and the tubercle bacilli from the same patient are so unlike from time to time and from source to source that constant results cannot be assured. Abderhalden's tests give positive reactions when no clinical tuberculosis can be detected, and the same is true of tuberculins. We find acid-fast bacilli in the blood, in the urine, in the sputum and in the feces. If tuberculous lesions coexist, we infer that these are tubercle bacilli. If not, we call them smegma, or pseudo tubercle bacilli. Would it not be nearer the truth to say that acid-fast bacilli were found, but that no tuberculous lesions could be demonstrated?

We admit the extreme frequency of infections by tubercle bacilli. We all agree that by the time our children reach maturity they have all become infected and sensitized. We must have in the United States between twenty and thirty millions of children under fifteen years of age. Shall we say that each of these children derives its infection from some human case, or that the universal infection of the human race must be due to some universal cause that can in no way be avoided? Is it possible that Ferran is right, and that the infection of the intestines by tubercle bacilli is analogous with that by colon bacilli, and that we might as well try to prevent the one as the other?

Kraemer has shown that fifty per cent of sanatorium cases show no relation to exposure. There is no tuberculosis in the family and no known way of communication. How shall we explain the death rate of one per cent from tuberculosis in the first year of life? One per cent of all the children to be born in 1914 will die before their first year is over of tuberculosis, and this without regard to exposure. We know that babes born of non-tuberculous parents and apparently well nourished and perfectly well, frequently die of tuberculosis when no exposure can be traced. The examination of prematurely born infants reveals the frequent presence of acid-fast bacilli with no structural signs associated with them. It begins to seem as if von Baumgarten and von Behring had instinctively sensed a fact of the greatest importance when they attributed the tuberculosis of adults to the intestinal condition of the child. It may be that we shall

some day know that the ability to live depends upon the ability of the child to restrain the pathogenic tendencies of an infection as common as that by colon bacilli, and when a babe is born with cavities in the lungs or dies soon after birth with tuberculosis, it dies, not because it has been exposed to an infection by tubercle bacilli, but because an inherent, inborn danger was never sufficiently overcome and the ability to live never sufficiently established.

Scientific investigations are leading us to believe that the infection of our children in the earlest years of life by bacilli capable of causing tuberculosis, is absolutely inevitable, and that it can never be avoided because it is coincident and synonymous with life itself. Therefore all we can do to prevent deaths from this universal, unavoidable infection is to detect the change from a harmless infection to a malignant disease. The presence of acid-fast bacilli in the blood or excretions of a healthy animal, or a positive reaction to tuberculin, does not constitute tuberculosis and does not prove structural lesions. They simply show that the infection is there and we must determine whether it is doing any harm or not.

If we have children, shall we rest content with keeping them away from known sources of contagion and bringing them up in fresh air with the best of food and care? As they enter school and college, shall we tell them that if their health is good and they live properly and are not exposed to infection that they will be in no danger from tuberculosis? That the maintenance of the proper standard of existence will suffice, or shall we impress upon them our belief in an ever-present source of danger from within that can never be sufficiently guarded against? Regardless of exposure, it strikes the rich and the poor, the wise and the unwise, the good and the bad; so that predestination comes nearer to explaining its vagaries than anything else. At all times, in all places, under all circumstances, the possibility of an ever-present source of infection creating disease must be guarded against by periodical examinations, in order to see if this danger exists and to detect it in time. Delayed diagnoses are the cause of death in the vast majority of cases. Detection in time is our greatest safety. Therefore our children should be carefully watched and examined while they are still at home, and when they go out in the world they should be abundantly instructed as to the true danger from tuberculosis. Parents should know these truths, but first our tuberculosis leaders and the profession generally must be convinced. We need a Tuberculosis Commission to place before us the life history of tubercle bacilli, just as the life history of the malarial organism has been so brilliantly placed before us. We should know whether a closed case is really harmless or whether the sputum contains far more virulent agents than the adult bacillus.

Our tuberculosis work is based upon insufficient knowledge. The dogmas and doctrines constituting our creed have been handed down and accepted by us without due testing of their value. Because quarantine avails in smallpox and cholera, we infer that it will be equally efficient against tubercle bacilli. From diphtheria and typhoid we infer that immunity is possible. This reasoning by analogy is exceedingly dangerous, and we need a competent scientist to co-ordinate and to properly present to us the real truths upon which to base our tuberculosis work. To establish the fundamental principles adequate for the protection of our people, we do not need to ask a Carnegie or a Rockefeller for funds. The South is abundantly able to pay for its own work. Five thousand dollars a year for this investigation will in the course of two or three years demonstrate whether it is best to attempt the prevention of the development of an infection inevitably acquired, by regular examinations made by competent experts, or whether it is best to depend upon quarantine efforts. If every member of the Southern

Medical Association would give one cigar a week to the cause, we could solve these problems for ourselves and for the world.

PROTECTION FOR THE POST-SANATORIUM TUBERCULOUS PATIENT.*

By Lucius B. Morse, M.D.,
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Of all the manifold experiences coming into the life of a physician, perhaps none is more replete with genuine disappointment than that of needless relapse on the part of patients once well. Not even the initation of the new disease carries with it quite the same pathos, for herein, ofttimes, the elements of prophylactic knowledge do not or cannot enter.

In the recrudescence of disease, however, these same elements of preventive knowledge can and should enter into the proper teaching of each and every patient (be the disease acute or chronic) so that recoveries are made permanent and good health restored.

If the tuberculosis sanatorium stands for one thing more important than another, it is to teach patients how to stay well. A patient who has spent any length of time in an institution and has failed to learn this lesson is very little better off than when he entered. In estimating a person's chances of getting well from tuberculosis, next to a good stomach comes character; whereas, in forecasting a person's chances of staying well, character comes first. A person without moral stamina rarely ever gets well from tuberculosis; and, if by accident or fate, he does get well (for a brief period) he is not likely to stay well. The sanatorium's great value is that it teaches a patient how to check up on himself; how to reason from effects back to probable causes; to measure up the results of one's own acts, whether they be active or passive, intentional or unintentional, wise or foolish.

*Read in Section on Medicine of Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

On leaving the sanatorium the patient enters upon what Babcock has wisely called the "danger period." While in the sanatorium all the conditions of life lend themselves toward conservation, and, I would almost say that, on leaving the sanatorium, all conditions of life lend themselves equally toward a dissipation of one's own vital forces. It is, if anything, harder to stay well then it is to get well.

FREQUENCY OF RELAPSE.

It is a lamentable fact that altogether too large a percentage of patients do not hold their cures or arrestments, as the case may be. The records of all sanatoria show concluively that a very large number of patients fail to hold their gains. The sense of solicitude which every physician feels on discharging even the most favorable cases is based on a knowledge of the above facts. It is truly a critical time when a patient first tries to sail his own bark—to be both pilot as well as patient. Of no other disease probably can it be said that relapses are so likely to occur.

CAUSES OF RELAPSE.

I think it may truthfully be stated in the outset that the most frequent cause of a subsequent breakdown is the fact that 90 per cent of the patients leave the sanatorium too soon. This, in many instances, cannot be helped. Pecuniary reasons absolutely preclude the possibiity of a prolonged sanatorium stay. A great many patients, however, would stay longer, thus rendering their cures more certain if they could be made to realize the tendency of tuberculosis to relapse. Curiously enough, telling them does not convince them —each person imagines somehow that the rules that apply to others do not apply to him.

The next important factor in the production of relapse might be classified as *causes from without*. By this I refer to a variety of things affecting the welfare of these people over which they have no control, or which they can control only in part. The patient's family, the neighbors, friends and others "interested," I believe to be a prolific cause of

sapping the vitality of the recent sanatorium patient. I refer particularly to visiting—both of the thoughtless and "thoughtful" kind. With a woman patient particularly excessive visiting is one of the most enervating "pastimes" in which she can indulge. Nervousness, insomnia, fatigue, loss of appetite and digestive power and increased temperature—are a few of the consequences. If it were possible, how many lives would be saved if those nearest and dearest could only be taught some of the plain truths affecting the welfare of the post-sanatorium patient. Doubtless, improper food and less favorable sleeping arrangements both make inroads on tissue resistance.

As an external cause, the common "cold" deserves more than passing notice. Only comparatively recently has the world begun to adequately realize the contagiousness of "colds," and the simple precautions that are so effective are even yet little understood, to say nothing of being put into practice.

Now as to the *causes from within*. Here we encounter the acts of the individual. As stated before, the sanatorium should, above all else, teach the patient to "know thyself." General advice of a precautionary nature, while valuable, is hardly in the same class with that which is directed toward knowing one's peculiarities and shortcomings. In spite of everything, however, the ex-patient still persists in disobeying health laws. He either plays too much, worries too much, or works too much. Perhaps he does all three. The fate of the poor is particularly hard, for, all too commonly, the question of work is not a matter of volition; it is a stern necessity.

FOREWARNING THE DEPARTING PATIENT.

For some time past I have made it a rule to forewarn each and every patient of the pitfalls that are before him. I try to make my advice not only along general lines but rather to adapt it to his own peculiar needs. Not only, too, should the patient be forewarned, but the family need likewise to be apprised of some positive facts conducing to the patient's welfare. Knowledge of this sort should especially be imparted to the particular member, or members, of the family who are most likely to carry out the orders and suggestions made.

Patient and family alike must be taught that looks are deceiving. Ofttimes the patient on leaving a sanatorium "looks better" than he ever did in his life. Is it not a most natural mistake for the public to feel that he is, in fact, as strong as he looks? Right here we encounter one of the severest tests confronting the patient. If he hews to the line in a conscientious effort to do as his physician has directed him, he is absolutely certain to be looked upon as lazy, morbidly introspective and altogether good for nothing. This statement may sound extreme, but I assure you it is not. Here is just where a person has to show courage, even to the point of abject indifference. We are all affected by the good and favorable opinion of those about us, but this is an instance wherein a thick skin is a better protection than a life insurance policy. The patient must be apprised of the fact that exactly this state of public opinion is in store for him on his return. Women more than men have trouble in facing it. Fortunate, indeed, is the patient in whose family there is a sensible person in control of the situation.

The patient must be warned against excesses of every sort. To err on the side of conservatism must be a rule of life. Crowded buildings, theaters, street cars and moving picture shows are to be absolutely shunned, not only because the air usually is superheated and moisture laden, but because of the danger of catarrhal and other mucous membrane infections. Keep away from all persons who have "colds." If a member of the family should contract one, its spread can almost absolutely be controlled by the simple precaution of sneezing and coughing only into frequently changed handkerchiefs. Of these and many others, the patient should be forewarned.

TRIPLE ALLIANCE.

Every patient leaving the sanatorium should come under the close observation of his family physician for advice and guidance. In this connection, there is real need for a sort of triple alliance between specialist, general practitioner and patient. The specialist, through long months in the observation of individual peculiarities, is in position to be of assistance in an advisory capacity both to the home physician and to the patient alike, and the local physician can better appreciate the local conditions confronting the patient. I believe that a closer understanding and cooperation on the part of all three would result in preventing relapses in many of these cases. The moral force of it would be worth a good deal. It is of immense advantage to a patient to feel that his family physician is backing him up to the letter in his efforts to hold his gains. The fight is a hard one, and all the help we can bring to his assistance is well worth our best and concerted efforts.

GENERAL RULES.

Before closing this paper I want to set forth some general rules for the guidance of ex-sanatorium patients:

1. Place yourself under the care of a good physician.

2. Approximate the sanatorium life closely, particularly in the beginning.

3. Rest in bed for one week.

4. Increase exercise (walking) with exceeding care both as to time and distance, and note results.

5. Take the precaution to "rest before getting tired."

6. Make regular hours a conscientious habit, both as to rest, exercise, meals and sleep.

7. Keep away from every sort of place of amusement and entertainment until thoroughly cured.

8. Reduce visiting to a minimum.

9. Maintain if possible a good body weight.

10. Be scrupulously particular regarding the morning bowel movement.

11. With increasing strength, exercise an increasing pride in the maintenance of a good bodily posture.

12. Taboo all dissipation.

13. Protect the patient if possible from all worry and strain.

14. Do not remain in the same room with a person suffering from any sort of acute inflammation of the nose and throat.

15. Finally, remember always that the things that made you well, in the main, are the things that will keep you well.

DIAGNOSIS AND TREATMENT OF TUBERCULOSIS.*

By DUNNING S. WILSON, M.D.,
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Much has been written upon the subject of diagnosing pulmonary tuberculosis. It has been read by many, practiced by some, but has not yet made sufficient impression upon the great mass of physicians to bring about a condition of diagnostic skill which permits every physician to make the diagnosis early with some degree of accuracy.

The methods for making early diagnoses are not so complicated that they cannot be mastered by all, but are apparently often studiously avoided in order that the diagnosis may not be made while there is an opportunity for relief and cure.

With malaria, anemia, nervous prostration, bronchitis, lagrippe and indigestion to fall back upon, the diagnosis of pulmonary tuberculosis is indefinitely postponed until too late to offer any real hope for improvement or recovery.

To diagnose pulmonary tuberculosis sufficiently early to give the patient every chance for recovery should be the physician's constant endeavor, but it is at the same time necessary that the physician be able to diag-

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*Read in Section on Medicine of Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

nose other pathological conditions as well, and he must be prepared to recognize the fact that tuberculosis is by no means the only disease which may be sapping the vitality of the individual, nor should he overlook the fact that tuberculosis may be present at the same time in the same individual suffering with some other disease.

I am well aware of the fact that the diagnosis of malaria is made by many physicians simply upon subjective and clinical symptoms, but I have not yet become expert enough to make a diagnosis of malaria unless the blood examination shows the presence of the malarial plasmodium.

It is by no means infrequent that physicians state that a patient is anemic merely by inspection, but I have not been able to differentiate the types of anemia or to state the actual degree of anemia without a differential white cell count as well as a haemoglobin estimate and red cell count. I should say by way of parenthesis that tuberculous patients are very rarely low in their red cell count, or in haemoglobin.

Neurasthenia is, after all, more a symptom than a distinct disease entity, but granting that it is a disease, certainly one must eliminate every other organic pathology before diagnosing the condition as nervous prostration, and not abuse the term because of poor diagnostic acumen.

Surely every one will admit that bronchitis is not a disease at all, but as its name implies, is an inflammation of the bronchi. A microscopical examination of the sputum will greatly assist us in arriving at a conclusion as to what is causing the bronchitis.

I wonder what we ever did without lagrippe, certainly between the 1st of November and the 1st of May, each year. Lagrippe, like Atlas, carries the world upon its shoulders.

Oh, Indigestion! What sins are committed in thy name!

If I were asked to name the early symptoms of pulmonary tuberculosis, I fear I could not do it because the symptoms of tuberculosis may be the symptoms of other diseases, and it seems to me that subjective symptoms but help to confuse. When we know that at least 33 per cent of our tuberculous cases give a definite history of blood spitting, and appreciate that the spitting of even a small quantity of blood is indicative of the possibility of pulmonary disease, why is it that the chest is not immediately examined? Instead, the patient's fears are quieted by pooh-poohing the matter or ascribing it to some other cause, without very careful investigation.

The early cases of tuberculosis do not cough to any marked extent, but certainly a cough which has persisted for a period of from six to eight weeks should call for a physical examination of the chest.

It seems to me it is like "carrying coals to Newcastle" to enumerate before this Association the methods of early diagnosis. The important thing to remember, however, is that skill is only obtained through practice, so that though we may be letter perfect in the symptomatology and physical signs of a given disease, but without practice and constant comparison we soon find ourselves giving way to other men who, though not so thoroughly book taught, are more *practice* wise.

With the death rate from tuberculosis reaching the proportions that it does, it seems not unfair to ask that every physician make a routine examination of the chest upon all of their patients whether the symptoms point directly to disease of the lungs or not. Thus will be afforded ample clinical experience in physical diagonsis, and physicians will be constantly surprised at the number of cases of pulmonary tuberculosis which would have remained undiagnosed and unsuspected without such a routine examination.

Anti-tuberculosis organizations throughout the country are not only inviting people to be examined at their dispensaries, but are persuading employers to insist that their employes be examined by the anti-tuberculosis

organization's medical staff in order that an accurate knowledge may be obtained as to the number of cases of tuberculosis existing in a community.

The force behind this movement cannot any longer be ignored, nor should it be, but the majority of physicians are going to find themselves discredited in the eyes of their patients because of their own carelessness in not making a diagnosis, or in not telling the patient, if they have made the diagnosis.

With the magazines teeming with medical information, State boards of health active in teaching the public regarding disease, and the laymen insisting on being from Missouri, the physician must admit that he is no longer looked upon by his patients as Dr. All Wise. If you want to really keep your practice and be regarded highly in your community, you must get in line and see to it that you can diagnose tuberculosis early, and you must acquire courage enough to tell the patients as well as the family just what is the matter with them.

With 90 per cent of pleurisies tuberculous with 90 per cent of blood spitting tuberculous, with an afternoon rise of temperature, malaise, digestive disturbances forming a symptom complex, which is very suspicious of tuberculosis, it is indeed strange that pulmonary tuberculosis is not more frequently diagnosed in the early stages.

The experience of medical staffs of tuberculosis organizations is practically uniform throughout the country, it being even now comparatively rare to have early cases referred by other physicians for treatment, although cases are daily being referred to them which are so advanced in the disease that improvement and recovery is out of the question.

If the physical examination is carried out with the following routine and with practice, pulmonary tuberculosis may be diagnosed early.

Patient must be stripped to the waist, though a small sheet may be draped over the shoulders in such a way as to permit careful inspection without any unnecessary exposure. If there is a slightly retarded motion, what is it due to? If, upon palpation, we note stiffness and loss of elasticity of the muscles of the chest, what is the cause?

Percussion must be made over corresponding portions of each lung. For instance, if we percuss over the supraclavicular space of the right lung, we must immediately percuss over the same area of the left lung in order that proper comparison may be made, and this must be followed out front and back and in both axillae.

If the percussion note is impaired over any area, no matter how slightly, what is the cause? If upon auscultation the breathing is prolonged and high-pitched over one area and not so over the corresponding area of the other lung, to what do you ascribe the difference in sounds? Is it normally so over that area or is it abnormal for it to be heard?

To my mind the one method in which I place more confidence in drawing conclusions than in any other single method, is, auscultation over corresponding areas when the patient is instructed to cough and immediately inhale and exhale. If this cycle of cough, inspiration and expiration is constantly practiced, it will demonstrate areas of infection not otherwise discoverable or suspected.

I believe that the X-ray assists in making the diagnosis of tuberculosis. I also believe that the subcutaneous use of old tuberculin is sometimes helpful in confirming the diagnosis, and this method, by the way, is the only one in which I place any great confidence, believing the inunction, opthalmic and cutaneous tests to be less useful than their ardent adherents affirm. I believe that Pottenger is offering a distinct advance in the diagnosis of pulmonary lesions, but for the present, at any rate, it is only useful in the hands of the most skilled tuberculosis specialists.

It is not to the tuberculosis specialists, how-

ever, that this essay is addressed, but to the physician who must have a few practical methods in order that he may make a diagnosis with some degree of promptness. Therefore, if inspection, palpation, percussion and auscultation are carried out along the lines suggested, there will be few diseased lungs which will escape detection.

It does not take X-ray machines, tuberculin, nor even microscopes to diagnose tuberculosis, but it does take constant practice, auscultation with the stethoscope, routine examination of not only the people who are presenting definite symptoms, but those who come with indefinite symptoms as well.

When you have made the diagnosis of tuberculosis in one member of the family, remember you are absolutely negligent as a physician unless you urge and persistently insist that every other member of that family or household be also examined. This is the first step in the real treatment of tuberculosis.

To diagnose tuberculosis is one thing, to treat the disease is another. There can be no real, permanent good obtained unless there is at the very beginning a fair, honest statement of the facts made to the patient, and a hearty co-operation given not only by the patient but by the immediate family and friends.

Treatment is not a matter of climate but of discipline, routine, self-denial and training, following out a definite plan for an indefinite period.

To accomplish lasting results in the home treament is possible just as it is possible to learn painting, music, language, shorthand, etc., without attending schools where such are taught, but it is admittedly better to learn in schools of instruction than to be self taught.

Tuberculosis sanatoria, or hospitals, are but schools of instruction in the proper method of caring for the health. For this reason physicians find that their patients are better able to understandingly continue treatment at home when they have first been inmates of a tuberculosis sanatorium for at least six months than when they are cared for in the home at the beginning of their illness.

Physicians will also reflect greater credit upon themselves if they will send their patients at once to institutions for the treatment of tuberculosis, for upon their return home the patients will then intelligently co-operate with their physicians in striving to regain their health.

Patients also will be more appreciative of the skill and judgment of their physicians, and more grateful for the advice which urged them to seek instruction in tuberculosis institutions before it was too late.

It is stated often that all that is needed in the treatment of tuberculosis is fresh air, food and rest, and on the face of it these three things seem very easy of attainment. In reality, however, the application in detail is anything but easy.

To be out of doors at least twenty-two hours out of the twenty-four, no matter what the weather, requires that the whole household shall readjust its ordinary living conditions to accommodate the patient. To secure proper food not only means that the raw material must be of good quality but that in its preparation it is palatable as well as nourishing. Rest is, after all, a relative term, and to secure rest means that work must be abandoned for an indeterminate period.

Tuberculosis cases divide themselves into three classes—the rich, those in moderate circumstances, and the poor. The treatment of the rich tuberculosis cases is largely individual. The treatment of tuberculosis cases in moderate circumstances is no longer individual, as the resources of these persons must be conserved or they will pass into the poor class. The poor are unquestionably the greatest menace to the public health, and unquestionably are to be dealt with as a social problem.

When it comes to specific treatment of tuberculosis there is bound to be considerable divergency of opinion. So far as my own

experience goes, the vaccines for the treatment of the ever-present mixed infection give results which cannot be obtained without their administration.

All of the tuberculins must still be considered as on trial, their value being problematical, although in many cases certain of the tuberculins seem to give happy results.

We must still hold fast to the methods of treament which have stood us in such good stead for a number of years, hoping at the same time for a discovery of a curative specific.

Patients running temperatures over 99 should be put to bed and instructed in the art of rest. It is perfectly possible for a person to be in bed, yet because of circumstances which interfere with true rest, benefit will not be derived therefrom. It may be necessary, in fact, to exclude visitors and to deny the patient the pleasure of reading for a time at least in order that the temperature may subside.

It goes without saying that out of doors is the place for the patient to rest. After the temperature has subsided, caution should be exercised in permitting the patient to walk, etc.

We must not be deceived by the apparent improvement and let down the bars too rapidly, because if we do, we will find that all of our previous labor has gone for naught. To select amusement, to prescribe a proper amount of work and play requires the greatest skill, and we had better be over-cautious than to err in the other direction.

To give patients buckets of sand to carry certain distances, and to gradually increase the weight in the buckets for the purpose of producing auto-inoculation temperatures, seems to me to be a most inane and dispiriting method of producing auto-inoculation.

Certainly patients must be absolutely devoid of a sense of humor who can carry buckets of sand to and fro under the supervision of keepers who stand, stop watch and thermometer in hand, watching for the indications which show a production of tuberculin in the patients' bodies sufficient for them to put down their little buckets and scamper off to bed until they have overcome the inoculation.

Give the patients whenever possible something to think about besides themselves; don't let them know their temperatures except in a deductive way.

If you want to produce auto-inoculation, give them something that will be of interest to them. Why, there are some people who can produce auto-inoculation by reading an exciting detective story.

Don't let your patient do anything without consulting you as to the advisability, and keep a firm hand over their coming and going. You must have absolute control of them, or both you and they will come to rue the day.

Medicines are needed to a very limited extent; train your patients not to expect a dose of medicine for every passing symptom which arises in the course of their treatment.

Bear in mind that when you resort to drugs you are conceding a certain amount of defeat and are acknowledging your own shortcomings.

We often hear physicians say that this drug or that one has proved most efficacious in their hands for the treatment of tuberculosis. When we analyze their reports, however, they usually prove to be too few in number from which to draw definite conclusions, and the success which they attained was really to be ascribed to their own careful supervision, to the judgment that they exercised, and to the personality which they put into their cases.

In conclusion, let me repeat that the essentials are, first, prompt diagnosis; secondly, cooperation of the patient; next, institutional training, and lastly, continuation of the treatment at home, bearing in mind that even the earliest cases of tuberculosis are not permanently benefited in less than a year of prescribed routine. Certain improvement and basic parts of the routine must become fixed habits of life if a relapse is to be prevented.

THE VALUE OF REST — PHYSICAL AND MENTAL—IN TUBERCULOSIS.*

By WALLACE J. DUREL, M.D.,
New Orleans, La.

It is pleasing to note that in recent years rest—physical, mechanical, and mental—is being recognized by the practical phthisiotherapist as a valuable agent in the treatment of tuberculosis.

Although the attention of the medical profession has been drawn to the value of rest—physical, mechanical, and mental—in other acute and chronic diseases, it is nevertheless a fact that the medical profession has been exceptionally slow to recognize the great value of *rest* in tuberculosis.

It is surprising, when searching our medical literature, to know how little has been written upon this important subject.

For years, perhaps centuries, the antagonist of rest—i. e., exercise—has been the "standard" measure accepted as a means of combating tuberculosis.

Though the latter practice is not based upon any definite theoretical or practical reason, its use has been handed down from generation to generation, and was promulgated for the very reason that it became traditional heritage—not to be blotted out so easily from the human mind, and less so from the medical mind.

The purpose of this essay is to show that, though we can derive some beneficial effects by the use of exercise, absolute *rest* must replace the latter in active tuberculosis, and modified *rest* in quiescent and arrested tuberculosis.

In considering the nature of the disease, its very infectiousness leads us to the adoption of rest in tuberculosis.

We know that exercise entertains the formation (to excess) of tuberculin protein poisons, and that the effects of the latter (in excess) upon the body cells of the human organism are deleterious to the improvement of the tuberculosis patient.

We know that the tubercle bacillus and its poisons not only affect the immediate tissues at the point of infection, but also affect every body cell of the human organism. Not only are the fixed tissue cells involved, but also the white blood cells

Drs. Solis-Cohen and the essayist have shown in a paper published in the transactions of the National Tuberculosis Association (1912) that exercise affects the white blood cells (more so the neutrophiles) not only in their quantitative value, but also in their qualitative value.

If this be correct, the harm done by exercise can be partly accounted for.

When we further consider the innumerable instances where exercise produces deleterious effects, we feel that rest must replace the traditional and indiscriminate practice of unguarded exercise.

In incipient tuberculosis exercise has been greatly abused, and rest has been overlooked and sadly neglected—thus, not only impairing the welfare of the tuberculosis patient, but also that of the healthy and susceptible individual; for every incipient case of tuberculosis who is allowed to drift into the far advanced stages is a menace to the nation at large.

My experience with hundreds of incipient tuberculous cases is that rest is most essential for satisfactory results.

I have made it a practice for the past decade to put all my incipient cases under absolute rest during the first few weeks or months of treatment.

In ordering absolute rest it is not sufficient to simply tell the patient that he must rest, leaving it to his discretion and choice. Definite written orders, specifying rest in the reclining posture and at definite periods, is essential for good results.

In the febrile case rest is still more essen-

*Read in Section on Medicine, Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

tial, for the case running a temperature of 100 F. or more should always be placed under absolute rest in bed and in the open air.

The tuberculous case whose temperature does not recede after a few weeks' rest is in a precarious condition, and should be guarded with the closest attention, and rest persisted with to the very limit. Such patient's meals should be served in his bed or cot, and no mental exertion permitted.

It is only by persistent rest that we may overcome the disseminated lesions in the acute active tuberculosis.

True, it may take weeks, months, and years in some chronic cases before we can observe the beneficial effects of absolute rest. It is in these very cases that the attending physician must be positive in his assertions, and that he must not allow himself to be influenced by sympathy or antagonism, and thus permit the patient to cease the carrying out of the prescribed rest.

If after a certain lapse of time the temperature, pulse, gain in weight, digestion, neutrophile index, etc., warrant the taking up of carefully guarded exercise, this can be done and timely enough.

As for a fixed rule giving the time that a patient should be kept under absolute rest, it is absurd to expect it. Each individual will act as his own index or guide—i. e., if after a few weeks' rest, the incipient tuberculous case shows upon exercise a loss of weight, temperature, increase of pulse rate, disturbance of digestion, a high neutrophile index, etc., he must be put back under an absolute rest until a similar test will be free from any such effects. By this alone can we maintain and favor the increase in the resistance of the tissue and blood cells, and thus protect the latter from the deleterious effects of the tuberculin protein poisons, which if allowed to persist in excess will finally deplete all the remaining resistance in the body cells.

Let us consider this important subject in a practical way, and not allow ourselves to be carried off by supposedly objectionable reasons that generally can be removed when properly crystallized.

We have in the carrying out of rest two conditions to contend with. 1. The incapability of the ordinary or poorer individual to rest. 2. The unwillingness of the wealthier individual to rest. The first may be overcome in many instances by impressing upon the other wage-earners of the family the necessity for absolute rest.

It is, however, in the family where there are no other wage-earners than the afflicted patient that we feel the necessity for some provisions to be made by the State; thus not only permitting the poorer patient to rest without worry and for an indefinite time, but also helping him in the maintenance of his family. This could be done by some measure of insurance, as practiced in England and Germany.

Of what use is it for the poor tuberculosis patient to rest for a few weeks or months in a sanatorium or camp if he has to return to the dying post, i. e., back to work, and thus lose in a few weeks what he has gained during his sojourn in the sanatorium?

It is far better to properly provide for such cases in a way that they can partake of the benefits of a prolonged rest, with the hope of eventually ridding them of their affliction.

The "farm" has been tried and suggested as a means of helping the poorer consumptive in earning his time and existence until recovery. This may be beneficial in certain cases, but surely cannot be applied in a general way. Could not many of the "farming" cases do better if kept under more modified rest and less active exercise?

We are told that the recovering patient must be prepared and trained by varieties of exercise in order that he may resume his previous work or occupation. Is this not more theoretical than practical? Is this not another of these theoretical conclusions promulgated by traditional heritage?

It has also been said that "prolonged" rest will make neurasthenics and slothful citizens of the tuberculosis patients. To any one who has used and applied rest as a protective and therapeutic measure in the treatment of tuberculosis, this statement will appear to be absurd and erroneous.

It has been surprising to me to see how tuberculosis patients will resume their previous occupations and perform their duties after months and years of closely applied rest, and this without the display of much exertion.

To my mind it is not a question of preparing the patient for his occupation or work; but one of ridding him of his tuberculosis and of his incapacity for work and of the danger of infection to his fellow-men.

In following the "farm" or auto-inoculative plan of providing for the quiescent consumptive, can we guard these patients with sufficient vigilance in order that we may tell when any of them have taken the sufficient inoculative exercise that will not prove injurious? This seems impossible unless there be a guard for each patient, and certainly this would not be an economical measure; in fact, less so than one providing for a prolonged rest. And then, do the statistics of farms, etc., show better results than those measures where rest is the prime factor and exercise the secondary factor?

Well guarded and intelligent exercise can be applied in certain cases of tuberculosis with benefit, but only after rest has been used and the disease quiescent or arrested. This cannot be done without individualizing, and then only under close attention and observation.

In applying rest one must be positive with those under his charge. We must not give way to the unwillingness of any patient whose life can be saved. Whenever we become weak and too sympathetic for a patient, we can expect a retrogressiveness in that patient's condition. I have always had cause to regret my giving in, through sympathy or otherwise, thus permitting the practice of exercises which were beyond my control.

It is astounding to note the effects of rest upon the temperature, weight, appetite, neutrophile index, etc., of tuberculosis patients. Do we observe such symptoms of improvement in the patients who are abusing indiscriminate exercise? In my experience I can answer, No.

To be convinced of the value of rest, it is necessary that patients should be exercised, as only then can we observe those deleterious effects caused by excessive exercise.

Let us all take up this experiment, and I am convinced that we will all soon be advocators of rest in place of exercise in active tuberculosis.

In concluding, let us not forget that the patient's psychic or mental condition must be carefully studied. Worry and uneasiness in the tuberculosis patient is of more serious moment than we have thought of.

Always alleviate any measure which tends to entertain worry and uneasiness; and it is for this reason that I believe that patients should be treated in their home. If agreeable to the patient, he can be sent away to some other State for treatment; but never, if he must be sent off, reluctantly.

It is better to give up treatment in any patient whose mental condition is continuously tormented by worry and uneasiness. Try all you can in such a case, and he will not improve. Therefore, in carrying out the rest treatment, always consider the mental state of the patient, and try to control his psychical defects. This will determine whether you are able to manage his case or not, and whether you are able to carry out the principles of properly applied physical and mental rest.

SOME PHASES OF THE TUBERCULOSIS PROBLEM.*

By Wm. Redin Kirk, M.D.,
Hendersonville, N. C.

Assuming that there are about ten living cases to every death from tuberculosis during the year, says Hoffman, it would appear that there are approximately 1,500,000 tuberculous persons in the United States at the present time, one and all of whom are potential foci of infection and the effective control, treatment and care of each and all of these unfortunates makes the modern tuberculosis problem the foremost of all questions in the successful administration of public health.

One million and a half persons actually suffering from the disease, to discover, control, treat and care for, to say nothing of the institution of those preventive measures which deal with social and economic questions too numerous to mention, causes the imagination to be appalled at the very stupendousness of the task.

Yet today an army of earnest workers, physicians, physiologists, biologists, sociologists, philanthropists and statesmen in their individual capacities, are solving some phase of this problem, as the death rate for the past years will show.

The only regret is that so much superb work must, from the very nature of our present methods of warfare against the disease, result in duplication of endeavor and great waste of the sinews of war. If only some genius for administration, with power to act, could sift the good from the bad and combine these varied yet correlated forces into one powerful co-operative whole what could not be accomplished?

That the whole tuberculosis problem is primarily a medical one, few will deny, because in the final analysis it is the medical man who must point the way, yet on taking a comprehensive view of the subject one cannot overlook the importance of the social side which strikes the marrow of the question in the maintenance of life itself. And the controversy as to whether the question is purely a sociological or purely a medical one is wasted time and energy.

It is no more one or the other than any function of the human body is independent of all the rest.

The sooner this is realized and the quicker we combine in some effectual way on the forces now at work, the sooner we can hope to overcome this greatest menace to human life.

To my mind, this is the greatest and most important next step in our fight against tuberculosis—a thorough, comprehensive and co-operative union, working upon the unit system of all the forces, medical, social and economic, in the field at the present time.

We, of the South, have this problem with us, as well as those of the North, West and East, only ours is a little different.

We are not so densely settled, we have fewer large cities, less foreign element, not so many free disposing occupational diseases, practically no crowded tenements, sweat shops, etc., but we have in our cities the negro sections, and the negro with us, always and everywhere. He is ubiquitous, and as much a health problem in small towns and in the country as in the urban centers.

Tuberculosis is quietly, slowly, and certainly solving the negro problem for us, with its frightful mortality, for that race, and it is also as surely a source of constant danger for the whites.

How best to meet this phase and all the other phases of the tuberculosis problem, we might say, is up to the State boards of health of the several States. Most interesting, but the hardest and most discouraging work the Secretaries of public health have is in interesting the profession in public health work. For this reason I would like to see this society

*Read in Section on Medicine, Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

appoint a committee to work in conjunction with the State Boards of Health upon some plan of concerted action by which all the forces at work for the prevention of tuberculosis might unite for more effectual results.

This committee should be advisory and not administrative, and they could report at the next annual meeting. Starting with Koch's discovery of the tubercle bacillus, and his demonstration of the infectious nature of the disease, our work became largely educational.

Let us review for a moment something of the work that has been done, and I think we can see where our labors have sometimes defeated the object we were striving for, and the necessity for concerted action which will not work round to its own undoing.

> "A little knowledge is a dangerous thing,
> Drink deep or taste not the Pyerian spring,"

was never so true as in our efforts to teach the masses how to protect themselves against tuberculosis.

The nature of the infection being only imperfectly understood resulted in a veritable fear of contagion amounting to phthisiphobia with many, until now by our well attended efforts to instruct and protect, we have added another phase of the problem which hinders and annoys often beyond expression those of us who would undertake the treatment of the disease.

Let me give you an example of how utterly unreasonable some people become under the influence of this obsession. A lady stopping at one of the principal hotels of Asheville 'phoned to one of the local physicians, who happened to be well known for his work in tuberculosis, and asked him to call to see her baby. He replied that he would come within an hour. In the meantime she was informed of his specialty; she immediately rang him up and told him she understood he treated tuberculosis, for him not to come as she was afraid he might infect her baby. This unreasonable fear complicates and makes much more difficult the problem of employment for the arrested cases we return to society.

I realize that the nature of our educational propaganda to arrest and hold attention must present facts in a startling manner, but I sometimes feel we have overshot the mark, and that it is about time to allay some of this fear by a more rational line of instruction, for if we question individuals coming from a tuberculosis exhibit, we will find more come away scared than instructed.

A wholesome dread of infection based upon correct information is to be desired, but an insane fear can do only harm to the cause. As soon as the infectious nature of tuberculosis was established, these patients were refused admission to our general hospitals until now there are only a few general hospitals that accept them even in especially reserved wards.

This wholesale banishment of cases from the hospitals, together with the fear that refuses these unfortunates accommodations elsewhere, has forced us, in the name of humanity, to give them asylum until today, the vast number of sanatoriums, special hospitals, day camps and preventories are concrete evidences of how well we have looked after this phase of the problem at least.

But when it can be said, as Barnes says in Rhode Island, in 1905 and 1906, 46 per cent of all sanatorium patients have been victims of mistaken diagnosis, it would appear that there must be some connection between the exclusion of these cases from the hospitals in connection with our seats of learning and this poor exhibition of diagnostic acumen.

How can we expect to have tuberculosis recognized early when the material for teaching is sent away to institutions too remote from the schools for practical use, or how may we hope to train nurses in this important work unless we give student and nurse special courses in tuberculosis sanatoria, or else admit the tuberculous again to the hospitals?

It is gratifying to see that Johns Hopkins and Jefferson have recognized this error and

that in Pittsburgh, Pa., and Chicago provision is being made to correct this mistake. In this connection we might ask: What are our Southern medical colleges doing? Can we afford to be behind our confreres in the East and North?

Encouraging also is the fact that beginning this fall Harvard University and the Massachusetts Institute of Technology are to conduct conjointly a school for public health officers. The object of this school is to prepare young men for public health work, teaching them to fill administrative and executive positions.

The public is slowly awakening to the economic value of health and all who observe must see that preventive medicine is the medicine of the future; I might even say the medicine of the present.

One other phase of the subject which I would like to mention has to do with the sending away from home of patients who have tuberculosis; not for treatment, but to build up by their own unaided efforts.

These patients, many of them open cases in various stages of development, are yearly sent to the mountains and elsewhere to mingle with the well and manage their own cases as best they can under all the difficulties encountered when they try to take the cure while endeavoring to conceal the true nature of their disease.

To know how well they succeed it is only necessary to recall the many sad and hopeless failures that finally come to the specialist when it is too late.

Reprehensible as this practice may appear when we think of its effects upon the individual, it is not to be compared with the havoc it is sure to inflict upon society at large. Not so long ago I received a letter which runs as follows, viz:

I am sending you a young lady with incipient tuberculosis. She has a great horror of the disease and of any one knowing she has it; for that reason I am calling it neurasthenia. Hope you will be able to secure her a nice place with some private family.

What was I supposed to do? Find a nice family free of disease themselves who were willing for a few dollars to run the risk of infection from a patient whose mental attitude was such she was not willing to take the simple precautions necessary to protect herself and others; or was I to call it neurasthenia, as my brother-practitioner would doubtless have me do and let it go at that?

No, doctor, it won't do; let's face the issue squarely.

No other disease, unless it be syphilis, is so protean in its manifestations. The mild case of today may be the grave one of tomorrow and again apparently hopeless ones in a short time may be on the road to recovery.

Tuberculosis is as capricious as a coquette when flirting with health, and it requires long practice and close observation to detect her varying moods and interpret her many expressions.

Certainly it must be a lack of familiarity with the disease in its protean forms or a too close looking for conformity to type that makes the medical man dilly-dally with his patient at the threshold of this dangerous disease. It is because this disease is so illusive we must be on the lookout for it when it is young in its curable stage and waste no time in doing the right thing.

Certainly it is not the right thing to send them from home and friends among strangers to find for themselves suitable environment and expect them to manage a disease as insidious and complex as tuberculosis.

Could the physicians back home see his patients trying to follow his well-intended instructions when they are in the company of the well, he would quickly see the folly of any such advice as, "Go to the mountains, get plenty of fresh air and good food and stay away from doctors." Let me give you a picture of what usually occurs. Let us say the patient does not look badly, only a little

cough which can be controlled with some effort except in the mornings or at meals. He starts out looking for a boarding place. If he coughs, he is asked if he has lung trouble. He doesn't care to lie deliberately and says it is a little bronchitis or asthma and just run down. The experienced boarding house keeper passes him up, After many rebuffs he stops at last at any place that will take him, which is usually a boarding house which takes boarders who are not very sick and keeps them as long as they can fool the others as to the real nature of their disease. It is needless to say no sanitary precautions are taken at these places because it would attract attention. Is this the environment you are looking for, doctor? Or let us say he has bluffed it through and gotten in at one of the best places. The first time he coughs, all eyes are upon him. If he wants to take his temperature, he must go to his room, maybe up a flight of stairs. He must hurry through a meal to relieve his cough, or worse still swallow his sputum. If he sits out and rests as he should, he is called lazy until, just to show there is nothing the matter with him, he commits the indiscretion of walking too far and pays the penalty. His days are filled with dread for fear he will be detected and asked to move on. Who could hope for results under such circumstances? Yet I see patients every day driven to me by some complication of advance of their disease who give me a history substantially as related.

Ignorance of conditions as they prevail at the usual health resort or unfamiliarity with the insidious, illusive and changeful character of the disease, or both, surely must be responsible for this unwholesome and dangerous practice.

What the physician should do who has a patient he wishes to send from home is to tell the patient frankly that he has an infectious disease—one that by carelessness may be easily transmitted to others. That for this reason few people, and especially those who run hotels and boarding houses for the well, care to take them, as they have no way of knowing whether they are careless or not. That they must live a different life from those who are well, consequently it is far better to go at once into a well-regulated sanatorium or report to some physician conversant with local conditions who will see they are located properly in surroundings best suited to their particular needs, where they can pursue the cure and feel welcome. Let us correct this and some of the other mistakes we are making in our fight against tuberculosis.

DISCUSSION OF THE SYMPOSIUM ON TUBERCULOSIS.

(Papers of Drs. Thrash, Lapham, Morse, Wilson, Durel, and Kirk.)

Dr. C. C. Bass, New Orleans.—This subject is so extensive that it would be entirely impossible for one to discuss many phases of it in the short time at our disposal. A few ideas have occurred to me directly in connection with these papers. I have been forcibly impressed, as I am sure all of you have, with the great importance of the subject and its magnitude by the papers, especially by the paper of Dr. Wilson. Dr. Durel in his paper brought out and emphasized the importance of rest in the treatment of tuberculosis. I think every one would endorse the idea expressed in his paper, and I quite agree with him that rest in bed is a very important part of the treatment of tuberculosis. Tuberculosis is a diseased process, is an inflammatory process, and rest is a fundamental principle for all diseases, and is it actually any more fundamental for tuberculosis than any other disease? I rather question whether it is. If we have an inflamed or involved joint, rest of the joint is the most important treatment to apply. Rest in tuberculosis, we must all agree, is of immense importance.

The discussion of the subject by Dr. Lapham brings out to my mind many possibilities and thoroughly impresses upon us that we know very little about tuberculosis after all. We know very little indeed about the disease. We do know it is produced directly or indirectly by some acid fast organism, as the tubercle bacillus which is constantly present in tuberculosis. I would emphasize here the fundamental fact underlying all infectious diseases, namely, that it takes something besides a specific organism to produce disease; that it takes something more than diphtheria bacilli to produce diphtheria. It takes something more than the meningococcus to produce meningitis, and it takes more than pneumococci to produce pneumonia, etc. Whatever that fundamental thing or influence is that leads one individual to develop what we call tuberculosis, and forty-nine others who get infected by the same organism, have the same organism in their lungs, but do not develop what we call clinical or active

tuberculosis, we would like to know. If you apply it to something, we can see it a little plainer. Given a case of furunculosis, because we believe it is produced by the staphylococcus, but I do not know whether it is or not, we can spread cultures of some of the staphylococcus all over the skin of a large number of other people and very few of them will develop furunculosis, although this particular individual, wherever you put a drop of pus, will develop another boil. A large number of people drink typhoid bacilli in water, and of them one develops typhoid fever and the others do not.

Dr. R. H. McGinnis, Jacksonville, Fla.—I have been very much interested in these papers, particularly in one point presented by Dr. Wilson; that is, to emphasize the importance of making a diagnosis in early cases. The incipient cases offer the best chance of recovery under treatment. When any superficial examination makes the diagnosis certain the patient is, in the majority of instances, beyond the aid of medical supervision.

Often more than one examination is necessary and the medical man who can be absolutely sure of his diagnosis in one examination is a rarity.

One other point: do not send the moderately or far advanced case to another climate, especially if he is poor. A rich man may buy attention, sympathy, surroundings, environment; the poor man can only obtain these essentials at home.

Dr. Charles L. Minor, Asheville, N. C.—So large a subject as this could not possibly be covered in five minutes allowed for the discussion, but I wish to say a few words. The great Bacon showed, a number of centuries ago, the right way to follow out any investigation of truth by the study of the actual fact and not by imaginary hypotheses, and the modern advances of medical science have been due entirely to following this method.

Now, while the papers of Dr. Thrash and Dr. Lapham were doubtless interesting on account of the theories and hypotheses that they advanced, they were perfectly worthless as far as advancing medical science is concerned. If the doctors had the time to demonstrate by appropriate experiments the numerous hypotheses which they have brought forward, we would be glad to listen to them; as it is, it seems to me that they have been wasting time and treading on dangerous ground. If modern scientific work has demonstrated anything satisfactorily, it is the question of the etiology of tuberculosis, and the work of Robert Koch needs today no defense. When some one comes here with a new theory and upsets this work of Koch he must realize that he must put it first to a thorough experimental test before he brings it before a medical body. Until he has done that, the work of Koch stands, and I think is likely to stand, for a long time, and that the tubercle bacillus can safely be called the cause of tuberculosis.

Referring to the paper of Dr. Morse, I believe it important that the patient leaving a sanatorium to return to his ordinary surroundings should be put in such shape that he will there be able to resume his life work and not have to continue an invalid's life at home. For that reason the sanatorium doctors, by gradual advances, prepare him by walking and exercises of different sorts so that when he goes home he will be strong enough to take up work without promptly breaking down. Too many patients, returning from a rest at a sanatorium to the rush of home work, promptly break down, when, if they were put through a gradual course of increasing work this would not occur.

Referring to Dr. Durell's paper, it seems to me it unduly accentuates the amount of rest which should be given to these patients. There is no question that exercise was formerly overdone, but we have come to a time in the treatment of tuberculosis when we find that rest is being overdone. Rest is just as much out of place at the end of treatment as exercise is in the beginning. To have a patient leave a sanatorium, as so many do, neurasthenic as regards their condition, fearing to raise a finger and treating themselves like hopeless invalids, is not success in treatment. Many tuberculous patients can return to ordinary work, and a large percentage will be able to do it splendidly if they have been properly instructed beforehand. Let me also say that nowadays it is becoming a fad to talk as though a patient **had** to sleep out to get well. While it is a very valuable adjunct, I have seen many patients get well without any sleeping-out, and since it is very often impossible to get sleeping-out for one's patients, it is distinctly undesirable to let the public suppose that sleeping out is a **sine qua non.**

Dr. Everett Morris, Sulphur, Ky.—This has been an exceedingly interesting symposium on an important disease.

I want to make a few brief remarks in order to tell Dr. Kirk and the other members present what Kentucky is doing with the tuberculosis problem. During the last Legislature there was created and provided for a State bureau known as the Kentucky Board of Tuberculosis Commissioners. Their line of work is to educate the people, and they are doing that by means of a free tuberculosis traveling exhibit car on the railroad, free moving picture shows given in a portable tent at county and State fairs, tuberculosis displays, lectures by trained workers and nurses furnished the counties by the tuberculosis commission, publication and distribution of literature, and by newspaper publicity. The law also provides that a county or several counties lying contiguously can declare a tuberculosis district, making county or district hospitals instead of State institutions. Buildings and maintenance to be paid for by the county or district. We believe we can accomplish more in the fight against this relentless disease by taking these hospitals to the people instead of taking the people to the big State institutions.

Fiscal Courts can declare these districts voluntary or involuntary. We have not been able to get a Fiscal Court to declare one voluntarily. We have, however, forced them, by a vote of the people, having just closed a campaign the fourth of this month in three counties, all of which declared districts. One was declared last year, so that Kentucky is just waking up to the big problem of tuberculosis, and in another year we will be able to make a report that will be worth while.

Dr. Louis Leroy, Memphis.—We need some unanimity of advice among physicians to apply to the tubercular patient himself, and before we do that we must discriminate between several classes. In the first place, a tubercular patient in whom

there is a chance and who has the means to take advantage of those means for recovery, may be advised in one way. The man who has not the financial means and no chance should be advised another way. The man who is a good deal dependent upon himself and still has not any great destruction, should be advised again in a different fashion, and lastly the hopeless case for whom sanatoria and trips and everything else may do no good, should be advised in still another way by asking questions. One of the first questions you may ask him is, how much money have you got? This is important, because there are thousands of poor fellows who have spent the last hundred dollars for a railroad ticket when they should have spent it for a square meal, and there are thousands of doctors who have not the nerve to look such a man square in the face and tell him if he has got a hundred dollars save it for a place to sleep and something to eat, and not give it to a railroad company and go and die on a stranger's hands. Withholding that information is heartless and still more treacherous. The slight cases that depend for their living upon a meager salary, who have no friends that can afford to maintain them for six months at least, had better be advised to stay at home and do the best they they can. The fact of the matter is, if a man has friends enough, who are enthusiastic for a day, he may get a hundred dollars or perhaps two hundred dollars (which is about the maximum ordinarily for him) in order to ship him away somewhere, that is not sufficient reason to advise him to go. We have an obsession that out West is the only place for tuberculous patients. I can only compare that to the obsession of many surgeons who jump on a man and go cutting him as the only thing when cancer is diagnosed. There are cases in which carcinoma is inoperable, and in which it is a charitable thing, a humane thing, to let him go on as comfortably as you can without mutilating him. We must recognize there are cases of tuberculosis in which this condition obtains, and we must so advise our patients. In this way we will improve the conditions in all our States, but at present they are far from what we need.

Dr. Robert Wilson, Jr., Charleston, S. C.—Referring to the treatment of tuberculosis, I wish to mention one point, and that is the importance of the practicing physician applying modern sanatorium methods in the home treatment of tuberculosis. We want to learn that tuberculosis can be treated successfully at home. While it is always best, unquestionably, to send patients to a sanatorium, there are many who cannot afford the expense that this requires, and though we cannot convert a private home into a sanatorium, the sane and proper application of sanatorium methods in these cases would revolutionize the treatment of the disease in many instances.

Dr. J. LaBruce Ward, Columbia, S. C.—I want to bring out one point in connection with Dr. Wilson's excellent paper, and that is, very often in diagnosing tuberculosis or a suspected case of disease, the majority of physicians fail to make a microscopical examination of the feces. I have known a number of cases of hook worm disease, where there was no tubercular focus which could be demonstrated, treated for tuberculosis. I know several instances in South Carolina of patients having spent several months in sanatoriums, spent all the money they had, and go back with no change in their condition, except their financial condition, and these men were cured by a few doses of thymol. I agree with Dr. Wilson that the most important thing is to exhaust every means to make a diagnosis, but where we have demonstrated that a patient is tuberculous we have not discharged our duty unless we have made a miscroscopic examination of the blood, the urine and feces.

Dr. W. A. Dearman, Long Beach, Miss.—I would like to call attention to one statement made in the paper of Dr. Thrash. In speaking of immunization in tuberculosis he stated that the lymphocytes were not regarded as phagocytes. Gerald Webb, of Colorado Springs, has demonstrated that the lymphocytes are practically the only leucocytes that are capable of digesting and disposing of the tubercle bacillus, and when we come to discuss tuberculosis and the blood findings in connection with the disease, and when we are confronted by a lymphocytosis in many tuberculous conditions we find in children and adults, it is not reasonable to suppose that we can doubt his hypothesis. It has been said, and I think rightly so, that no one has ever yet seen a tubercle bacillus in a polymorpho-neutrophile in vivo. I have never seen it.

When we come to consider the lymphatic system I have no evidence at hand to say that this system, so far as lymphocytes are concerned, aids in the defense of tuberculosis.

Dr. Wilson emphasizes the importance of the early signs of tuberculosis, and I will admit that in many cases following in the wake of the grip, chronic bronchitis, it is hard for me, even with any physical signs I may find in the chest, to make a positive diagnosis of tuberculosis, when it means so much negatively or affirmatively to the patient or myself.

I was in Denver a year and a half ago when I saw an unfortunate patient who had no finances, but got enough from his friends and from private contributions to send him away from his interests and his friends and cast him upon the whole world to die without friends and without home. I have seen them die penniless.

The precautions taken with tuberculous individuals are not the best. I have seen patients die from tuberculosis and the next morning some one would be engaged in dry sweeping, and then a new family would move in without fumigation. Our laws are lax in this regard.

Something was said in regard to vaccines in the treatment of tuberculosis. I have had considerable experience in the treatment of complications in tuberculosis of a streptococcus nature, and have employed vaccines from the individual strain (autogenous), and I do not hesitate to say that I have found nothing that did the patient any good, and that one negative phase was superimposed upon another, and the vaccine attended in the majority of cases with frightful reactions.

Dr. James A. Hayne, Columbia, S. C.—Dr. Hayne spoke of the negro problem in relation to tuberculosis. In Charleston, S. C., we have secured accurate data since 1881, and statistics show that not only is there a decrease in the amount of

tuberculosis among the negroes, but also an actual decrease in the death rate among those living in Charleston, although there is a relative increase in the number of negroes. I am afraid we will have to adopt some more drastic measure to get rid of the negro problem in the South than having them die of tuberculosis.

Another proposition Dr. Hayne called attention to is that a campaign has been waged by what some one has called half-baked sanitarians, and that word is as good as half-fried surgeons. These half-baked sanitarians or uplifters have gone over the country and conducted a public campaign against tuberculosis, and they have pictured such a condition of affairs that it makes one hesitate to be the father of any more children. I have seven and I wish I had stopped. (Laughter.) You probably remember what they did in the public schools in your day, and not mine. The children were taught the evil effects of excessive drinking of alcohol. They were shown the mucous membrane of the stomach which looked like a Kansas cyclone. The children were taught these things. Tney saw their fathers, brothers and uncles drinking, and they saw none of these awful effects. They were told about the evil effects of smoking after a meal, and when they saw their fathers smoking with no ill-effects, they lost confidence in the teachings regarding the terrible effects of alcohol and tobacco. They see tuberculous patients living in families and none of the rest of the family developing tuberculosis, and they are beginning to be a little dubious as to the extreme contagiousness of tuberculosis. Is it best to keep up the teaching of this phobia or tell them to examine the facts about tuberculosis and how hard it is to contract the disease in a well person from a sick person? It is the same phobia that exists about leprosy. While leprosy is contagious, it is contagious only through extremely long exposure to the contagion, and the same is true of tuberculosis.

As far as State control is concerned, I believe that in the segregated portion of South Carolina which was segregated in the early Colonial history, a line being drawn, and which portion we now call North Carolina, has adopted a plan that is very good indeed. They have a central sanatorium for the treatment of tuberculosis, and have a correspondence school for those individuals who are reported to the Board of Health as having tuberculosis. The patients are taken to this hospital and are taught how to take care of themselves there, are made to get better and sent home knowing how to pursue the methods that had been taught them, and they keep it up at home.

Dr. James V. Freeman, Jacksonville, Fla.—Dr. Wilson laid special emphasis upon the examination of the chest in patients who spit blood. I think it is dangerous advice unless modified, since the greater proportion of these cases are tuberculous. It is the safer plan, I think, to treat such patients conservatively, taking it for granted that they are tuberculous until you can prove otherwise. That was brought home forcibly to me by a case I had some knowledge of not long ago. A young lad spat some blood. He was taken to a throat specialist; the throat specialist looked him over and thought the hemorrhage came from the throat. He made an examination of the chest and then referred the patient and father to another physician. The patient was taken to the office of the other physician and the boy's chest gone over again. Not being able to make out anything definite about it, this physician asked his assistant to examine the boy, and he went over the chest also. The father was still unsatisfied, and after leaving the office of this physician he took his son to still another man and the lungs were gone over again. Then they went home. That afternoon the boy had a brisk hemoptysis and was in desperate condition for days. He had had too much examination. It would certainly have been much safer for all of those men to have said from the history that the lad had probably a tuberculous infection, and to have sent him home to keep quiet; waiting until there was no trace of blood in the sputum before attempting physical examination, and meanwhile searching the sputum carefully for tubercle bacilli.

Dr. Charles V. Stephenson, Centerville, Tenn.—It seems we are pretty much agreed as to what we can do and what is to be done in cases of tuberculosis, but I would like to have heard some of the gentlemen who are treating this disease in a special way make mention of artificial pneumothorax and see reports as to what has been their experience. I have seen the operation done several times lately and the surgeons speak very highly of its merit. I have not had an opportunity of following up the cases. It appeals to me as being a very rational measure, and I shall hope to hear of great results, and if it should not prove a success it will be no worse than many things already tried.

Dr. William L. Dunn, Ashevillle, N. C.—There are two or three points I would like particularly to go into because I believe they are practical ones.

As to the methods for obtaining results in tuberculosis, I think experience has shown that various methods have been successful in different men's hands. To obtain a temporary result is not really difficult. As a matter of fact, it is rather easy. There is no need to concern ourselves so much about a patient getting well as it is how he is going to stay well. It does not satisfy a patient to tell him that he may remain well three or four weeks, or three or four months; he wants to get well or get a result that will hold. There are some reasons why patients do not do well after they get home. Let me mention one or two of them. Some of them have been mentioned by Dr. Moore, and among them the question of time. We are in too big a hurry to get through. If we understand the pathology or histology of recovery from tuberculosis we realize that the time element is one of the most important things, and my experience after twenty years' treatment of tuberculous patients has convinced me that a patient who gets well in two or three months did not need any doctor. His case was not one of active clinical tuberculosis. It requires months and many months—at least six months—to obtain a result that is going to amount to very much.

The next thing is the point raised by Dr. Minor, and emphasized by him, and that is preparing the patient for his future life's work. No man has a right to discharge any patient until the sum total of that man's exertion exceeds what will be the

sum total of his exertions when he gets away. You have not prepared him for his life. He must be able to do more next week after he has left. He wants to be so hard physically that he does not need to go to bed at your instigation.

As to the word cure in connection with tuberculosis, it means something definite not only to the laity but to the physician. It means eradication of the disease. It means a thing of the past. If a man has once had measles he does not expect to get it again. It is a thing of the past. I believe the minute a patient has tuberculosis, that moment he is in danger. Once tuberculosis, always tuberculosis. You can say to a patient you have got tuberculosis; be sure it does not get you. A patient is not cured in the sense that he believes he is cured. Let him go away with the idea he is tuberculous and is going to continue to have it. I believe it is important to let a patient carry the sword of Damocles over his head as suggestive of fear, and if he does, he will be constantly careful.

Dr. E. C. Thrash, Atlanta, Ga.—In regard to Dr. Minor's statement, that I did not have time to study these cases or to investigate them, he does not know how much time I have. He says what I have arrived at is entirely worthless, because it has not been proven. Almost everything I stated in my paper has been proven, and I will say for Dr. Minor's benefit, it will not be five years before he will be right with me and agree with everything I have stated. I have studied this question carefully. I started it by saying that tubercle bacilli will not grow within liquid culture media. They will not. That has been proven in the laboratory. You cannot grow the tubercle bacilli except they are floating upon the top of liquid media. I said it takes two or three weeks for them to develop under the most favorable circumstances. That has been proven. I said individual tubercle bacilli perched on mucous membranes do not produce infections. That has been proven in the rectum. I said tubercle bacilli have passed through with oleaginous emulsions into the lymphatics and we find them distributed all through the mesenteric lymphatics in children, and they could not have gotten through except by passing through with the ingestion of food. I said the tubercle bacillus lodges in the metaphyses of the long bones and sets up infection there and later reaches the joints. It has been definitely proven that the primary infection in tuberculosis is not at first in the joints, but begins in the metaphyses. I said they produce emboli in these metaphyses in an environment where they can grow and have time to form tubercles. That has not been proven by the tubercle bacilli, but it has been proven in infections of the joints, pyogenic infections, in osteomyelitis for instance. These emboli and these infarcts in osteomyelitis can be seen there where they have plugged up the vessels, and infarcts also take place. These things are not theories. They are established facts, and Dr. Minor has no right to say that a man does not have time to make investigations. Suppose we rest on our oars and say, "We do not know whether it is true; therefore, we will pass it up?" We never know anything until we study questions, and we will never know anything unless we start out into unexplored territories, and we are going to make mistakes in doing this. We are going to go wrong sometimes. Does that mean we should not make any further investigations? Not at all. It is our duty to study and make reports. The man who makes a suggestion may be entirely wrong on his hypothesis and conclusions, still other men may develop something where he left off.

He said I made the statement that tuberculosis was not caused by the tubercle bacillus.

Dr. Minor.—I did not say that.

Dr. Thrash.—In reference to the statement by some one that I said lymphocytes were not phagocytes, I did not say they were not phagocytes. I said the lymphocyte was not primarily a phagocyte; the lymphocyte does produce an enzyme that destroys the tubercle bacillus, but the waxy and fatty consistency of the tubercle bacillus prevents the enzyme from attacking it successfully.

There are two important blood cell types, the polymorphonuclear leucocyte and the lymphocyte. The primary function of the polymorphonuclear leucocyte is phagocytosis, but as the tubercle bacillus cannot be destroyed easily by phagocytic action, the latter type of cell takes but little part in defensive action in the system of removing these the lymphocytes, the newly proliferated connected tissue cells and the endothelial cells of the capillary vessels, called epitheliod cells after they make the change. These latter cells are primarily intended to form tubes for the circulation of the blood in the capillaries, but when they take up the work of defending the body against the tubercle bacilli they become globular, the capillary is obliterated and they are transformed into soldiers to fight these tubercle bacilli. This accounts for tubercles not containing blood vessels. The above-mentioned cells unite their forces not only to form a bulwark by surrounding the cluster of tubercle bacilli and forming a tubercle, but they also elaborate an enzyme which disintegrates and digests the tubercle bacilli, but they do this in an inefficient way on account of the endotoxins contained in the tubercle bacilli and their waxy and fatty consistency.

Dr. L. B. Morse, Hendersonville, N. C. (closing the discussion on his part).—I wish to put myself on record as absolutely opposing the idea which Dr. Dunn has promulgated, and which he brought before the National Association for the Study and Prevention of Tuberculosis, two or three years ago, namely, "once tuberculous, always tuberculous." I seriously object to such a doctrine when we know that practically everybody before the age of puberty reacts to the tuberculin test. Postmortem examinations, if carefully conducted, on practically every one past forty years of age, show unmistakable tuberculosis. When we know these things, it seems to me unjustifiable to say that a person who has had incipient tuberculosis and has made a good, substantial recovery, is ever after tuberculous.

In regard to the word "cure." I am thoroughly cognizant of the fact that ordinarily a person ought not to use that word as loosely perhaps as I have used it in my article. I was trying to emphasize the necessity of accepting the word cure in the practical sense in which most people accept it, not using it in a purely technical basis.

Dr. Dunn also made the statement that no physi-

cian had a right to discharge a patient where it is necessary to pursue the life which I outlined in my essay. I wish to say simply that most of them discharge themselves. If I had it in my power I would never make it possible for any patient to follow out the precautions which I laid down in this article, but I have, in many instances, been unable to keep patients a sufficient period of time to get the more substantial cures. Everybody knows that in the great majority of cases you cannot hold people long enough to bring about stable cures. They get from under our care and have relapses. The remarks I made were directed towards the care of these cases, in the condition in which they leave in the great majority of instances.

So far as I know, I was one of the first to give autogenous vaccines in tuberculosis, in the South at least, and I am a believer in the value of them in secondary infections of tuberculosis. The whole matter is, of course, in an experimental stage, but I am convinced we are getting results.

There is one other point I wish to speak of, and that is as to how people really get a tuberculous infection. To summarize it: Originally it was supposed to be hereditary; then we saw the pendulum swing the other way, toward dust or house infection. Now the most advanced thought is that the majority of them got their infection in childhood; that the germs are pent up in the lymphatic glands, and at later periods of life, when the body tissues are more susceptible to transplantation of germs, their metastasis takes place to other tissues, commonly the lungs.

I want to object to a statement made by one of the essayists, that practically all of these cases of infection in children were intestinal. I believe that is a misake; that is to say, they were mouth infections, but not intestinal infections. In children who have tuberculosis, the cervical glands come first as points of infection; second, the bronchial glands, and third the mesenteric glands; so, according to that, the evident avenues of infection must be through the tonsil as a mouth infection; next, probably comes the respiratory infection in children, and third, the germs pass through the intact intestinal wall and infect the mesenteric glands.

Dr. Dunning S. Wilson, Louisville (closing the discussion on his part).—With regard to hook worm disease complicating tuberculosis, examination of the blood, the urine and feces shows a small percentage of hook worm cases. We have been making routine fecal examinations because of the fact that some of those engaged in hook worm work have made the rather broad assertion that many cases of so-called tuberculosis are not tuberculosis, but really hook worm disease, and for that reason, after having examined three hundred cases, we have only found about one per cent, and these cases, mind you, were unquestionably tuberculosis as well, hook worm disease being the complicating factor.

With reference to the spitting of blood, if Dr. Freeman is willing to admit on the symptomatology of blood spitting that the case is tuberculosis and so treats it, the results after all are just exactly what would have been obtained under other circumstances. It seems to me rather unwise under the circumstances, in treating a case, to do more than to make the patient realize it may be tuberculosis until a careful examination is made. There may be, of course, any number of symptoms that may produce a condition which is attributed to the lung, when it may come from the stomach or otherwise.

The difference of opinion regarding vaccines is bound to continue. We have threshed that out in surgery or in special lines of work, and when one has gone over the field and felt fairly sure of his results, he uses that anchor which best holds the ship in the harbor, and with me I think vaccines serve a useful purpose in getting results.

Dr. Wallace J. Durel, New Orleans (closing the discussion on his part).—I do not want to be understood as saying that "a tuberculous patient can never be well."

As for the value of rest in tuberculosis, I have not drawn conclusions from a theoretical but from a practical standpoint, and only after comparing results in hundreds of cases.

The only way to draw final conclusions is to treat a hundred cases with absolute and modified rest, and a hundred cases without rest, and then compar the results.

Do not abuse of rest; do not abuse of exercise; do not enforce rest to the point that it will become injurious. I never pretended to say that absolute rest should be persisted with in the apparently well. Let exercise be gradual and it will be useful.

The point I wish to emphasize is that the practical end results are what we must base our conclusions upon, and not the theoretical opinions of different individuals.

Anyone who has followed the tuberculous, in the clinic, is not going to allow his patients to become neurasthenics; otherwise he should not treat tuberculosis. If a doctor can influence his patient as to fear tuberculosis, and thus force a thorough course of absolute rest, he can also control that patient after absolute rest is no more indicated, and then impress the fact that well-regulated and graded exercise will be beneficial.

He can now tell his patient to have no fear of exercise. This is a practical way to look at things; for going to extremes one way or the other is not going to lead to final beneficial results. We must be unbiased and not unscrupulous in considering the question under discussion. For ten years we have been debating this question, and I see Dr. Minor has not changed opinion on some points.

If Dr. Minor would keep a hundred cases under absolute rest, and then under modified rest, until they are well (not allowing them to return to reckless exercises unless they are free from any lesions) it will convince him, and others, that what I have said is true.

In conclusion I wish to say, with the chairman's permission, that we should encourage more of our young men to specialize or limit their work to tuberculosis. By doing this they will become more proficient in their work and will be better fitted to solve these great problems which we are forced to encounter, and which can best be solved by the practical phthisiotherapist.

Dr. W. R. Kirk, Hendersonville, N. C. (closing the discussion).—I am gratified to have heard the remarks of Dr. Morris, and I can tell him that in

North Carolina we are also doing some work that deserves credit. We have at the present time ten counties out of 120 in the State where the whole time of one physician is devoted to public health work. The salaries vary from $1,800.00 to $2,500.00. They are county health officers and devote their whole time to public health work.

I am glad to know from Dr. Haynes that they are taking good care of the negroes in South Carolina.

SECONDARY INFECTIONS IN TUBERCULOSIS.

By J. B. Rogers, M.D.,

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Mixed infection in tuberculosis has been extensively studied. In making a perusal of the vast amount of literature on the subject, one is struck with the diversities of opinion held by numerous workers. In main these can be grouped as follows:

1. Those that consider the tubercle bacillus directly responsible for the entire pathology and symptomatology of the disease.

2. Those that consider the tubercle bacillus and the secondary microorganisms the joint causative factors.

3. Those that give the pre-eminent place to the secondary microorganisms.

In the first category may be mentioned Pick (1), who observed septic temperature, chills, night sweats and large amounts of purulent sputum in patients whose sputum contained only the tubercle bacillus and whose lung tissue at autopsy was free from secondary microorganisms. In the same category is Whitney (2), who collected sputa of tuberculous patients in a sterile receptacle, e. g., Petri dish, and with a wooden spatula rolled them around till the mucus had adhered to the sides of the dish, leaving a lump of pus; from this he made smears and stained them. In a study of one hundred cases he found secondary organisms in only four; two cases showed the influenza bacillus; one case, streptococcus; one, pneumococcus.

Radcliffe (3) used Sargos' method, which consists of washing a lump of sputum twenty or more times in sterile water. He studied twenty-two cases, making thirty-three examinations in all; seventeen of these were negative for secondary bacteria; from the washed sputa of those he was able to grow the tubercle bacillus in pure culture.

The second and third category of writers above referred to include a large number of workers whose conclusions are based on the study of blood cultures, autopsies and clinical observations.

Ortner, Sato, Cornet, and Kitasato (4) examined the walls of lung cavities, making the examination as soon after death as possible. They found that the pyogenic organisms in the lung tissue corresponded to those found in the sputum before death. Ravenel and Irwin (5) made similar investigations, but they were unable to establish any connection between the organisms found in the tissues and those found in the sputum before death.

Norris, Pappenheimer, and Ophuls (6) consider information derived from autopsies practically valueless on account of the readiness with which contaminations extend down the respiratory tract during or just after death.

The study of mixed infections by Sargos' method and blood culture gives us the most reliable method of diagnosing mixed infections.

The reports by Brown and Petroff (7), Pettit (8) and others suggest that a pneumococcemia or streptococcemia is a frequent occurrence in pulmonary tuberculosis.

I took up the study of mixed infections in tuberculosis in August, 1911, at the suggestion of Dr. Theodore B. Sachs, Medical Director of The Edward Sanatorium, whose kindness made it possible for me to carry on the work.

Sputa were collected from 82 cases and washed five or six times in sterile water or boullion or rolled in a Petri dish according to Whitney's method, either method giving prac-

tically the same results. From some of the lumps smears were made and stained; other lumps were planted on some of the following culture media: agar agar, blood agar, glucose litmus agar, gelatin, boullion, potato, etc.

Secondary organisms were found as follows:

Pneumococcus	48 times
Streptococcus	31 times
Staphylococcus	18 times
Influenza	10 times
M-catarrhalis	6 times
M-tetragenus	4 times
Pseudo-diphtheria	3 times
Bacillus coli	3 times
Friedlander's	1 time
Sarcina	2 times
Hay bacillus	2 times

The occurrence of pneumococcus in bloody sputum was quite noticeable. Purulent sputa contained fewer secondary organisms than mucopurulent and mucopurulent fewer than mucus. By the number of bacteria found in the sputum it was possible oftentimes to tell the source of expectorated blood. In 50 cases, making 81 tests, I employed Sargos' method of examination of sputum for secondary organisms. After washing, lumps of sputum were planted on blood agar plates and from that transplantations made on other culture media for identification. The results from this method were about as follows:

34 cases were negative for secondary organisms
9 cases showed pneumococci in pure culture.
1 case showed streptococci in pure culture.
3 cases pneumococci and streptococci.
2 cases micrococcus catarrhalis.
1 case pneumococci and staphylococci.

At a glance it will be seen that these results are quite different from the results obtained by the previous method. This method gives fairly satisfactory results. Sargos' method, however, cannot be applied to all sputa, inasmuch as some will become completely broken up before the necessary washings have been completed.

Blood cultures are the most direct and reliable method of diagnosing mixed infections. By this method I have studied 119 cases, making 140 examinations. The usual method employed was to draw 5 to 15 C. C. of blood from one of the arm veins, using aseptic precautions. The blood was planted either in a large number of agar tubes, having been melted and kept at about 43 degrees centigrade and plated, or by planting the blood into boullion made from fresh lean veal or beef and adding 25 to 35 C. C. 1-10 normal Na-OH per liter, as suggested by Dochez (9).

Results: Twelve cases showed streptococci and two cases showed pneumococcus. Staphylococcus contaminations were excluded. This work as yet does not indicate that secondary infections occur in all cases of pulmonary tuberculosis, neither has the finding of these secondary or mixed infections in connection with any particular case rendered the prognosis less favorable in the cases so far observed.

(1) Cited by Pettit—Journal Infectious Diseases, November, 1911, page 238.
(2) Whitney, J. L.—Seventh Annual Meeting, Association for Study and Prevention of Tuberculosis, page 318.
(3) Radcliffe, J. A. D.—British Journal of Tuberculosis, January, 1913, page 33.
(4) All cited by Pottenger, F. M.—Diagnosis and Treatment of Pulmonary Tuberculosis, page 256.
(5) Ravanel, M. P., and Irwin, J. W.—Third Annual Report of Henry Phipps Institute, page 216.
(6) Journal Experimental Medicine, 1905, page 450.
(7) Brown, L.; Petroff, S. A.—National Association for the Study and Prevention of Tuberculosis, Eighth Annual Meeting.
(8) Pettit, R. T.—Journal of Infectious Diseases, November, 1911, page 238.
(9) Dochez, A. R.—Journal Experimental Medicine, November, 1912, page 680.

THE MEDICINAL TREATMENT OF BRONCHITIS AND PNEUMONIA.*

By I. L. Van Zandt, M.D.,
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In treating bronchitis and pneumonia under one head I am differing from most writers,

*Read in Section on Medicine, the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

who treat them separately, probably because of macroscopic differences.

I have elected to treat them under the same head because the same organ is involved in both, and both are the result of infection. the same micro-organism, or micro-organisms, sometimes causing one and sometimes the other disease.

Some forty years ago I began to question the then generally accepted opinion that pneumonia, coughs and colds came from exposure. I had observed that they came in a great many cases without special exposure, while a great many people were severely exposed to wet and cold without contracting any of them. I also observed that these diseases were more likely to prevail in a dry winter than in a wet one. I admitted that such exposure might precipitate an attack when the subject was ripe for it; might shoot the gun off if it was loaded, not otherwise. I was accustomed to say that these attacks "came from something we breathed."

Cocci and bacilli, as causes of diseases were unknown in those days. It is true, I had read where Rezin Thompson, a country doctor of Tennessee, had attributed dysentery to animalculae infesting the colon; and also where Dr. Caldwell, an eminent physician of New Orleans, had searched with the crude microscope of those days, the Mississippi River water when the cholera was prevailing, in the hope that he might find the cause of that disease.

Having rejected the old theories, I was in a ready mind to accept, when offered, the doctrine of a germ origin for pneumonia, which I did with my whole heart.

I had come to recognize that a typical pneumonia had a limited course to run, though indefinite in length. I had not sought to cut short or abort the disease, but only by judicious means to mitigate the symptoms and avoid the dangers of the disease, as the pilot in a dangerous pass through which he must needs go, steers to miss here a sunken rock, there a sand bar, and so on, until the open sea or a safe harbor is reached.

This was my state of mind when, on January 8, 1894, I called to see a pneumonia patient to whom I had the day before given creosote, on account of intestinal irritation. The patient was strikingly improved; pulse and temperature below normal, and entirely comfortable, though expectorating a large quantity of rust-colored sputum. The patient had been sick only 72 hours. The dose was reduced and the temperature rose; was increased, and the temperature came down. This was the beginning, so far as I know, of the creosote treatment.

This treatment I continued without change until October, '99, when I began substituting creosote carbonate for beech wood creosote, having seen a report of its use by Cassoute and Cordier, as given in a paper read at Marseilles, France.

Since then I have given it habitually, though occasionally substituting guaiacol carbonate, or thiocol, because they are less offensive.

In support of the claim of the curative effects of creosote in pneumonia, I summarize (1) statistics collected by me in 1902, which were obtained as follows: I had printed a circular asking those who had used creosote in the treatment of pneumonia to report to me the number of cases and number of deaths. About seventy-five of these were sent to medical journals for publication and a few to parties who I knew were using creosote.

Reports came from 23 States, Ontario, Mexico and Honduras, made by 71 physicians, embracing 1,130 cases, with 56 deaths, a little less than 5 per cent. Complications were reported in many fatal cases.

The circular asked these questions:

1. "Do you believe creosote ever aborts pneumonia?"

To this, thity-seven reporting 762 cases, say "yes"; fifteen, reporting 187, say "no," and nineteen, reporting 177, fail to answer. Those reporting a little more than two-thirds of the cases assert the abortive effects of creosote.

2. "Do you believe the majority of cases are mitigated by it?"

To this, fifty-seven, reporting 1,022 cases, answer "yes"; two, reporting 10 cases, say "no"; the remainder fail to answer.

3. "Have you ever found cases which, having plenty of time, were entirely uninfluenced by it?"

To this twenty-three say "yes"; thirty-one "no," and sixteen fail to answer.

These answers furnish strong confirmation of my conclusions given in a former paper, viz.: (2) "A large per cent of pneumonic cases are cut short or aborted, almost all the rest are mitigated, and the remainder, a very small per cent, are not at all affected by the remedy."

In June, 1898, I read a paper (3) before the North Texas Medical Association, claiming a curative effect for creosote in pneumonia, though acknowledging an unevenness in results, some cases yielding promptly, others more slowly, showing only a mitigating effect. Later, I saw cases in which the treatment gave absolutely no good results. Some of these, the microscope showed to be other than pneumococcic infection. In three cases, two of which were shown to be streptococcic, and the other, from the symptoms presumed to be, I used antistreptococcus serum with seeming good results.

The idea had grown in my mind that creosote was good in pneumococcic but not in other infections, and in 1904, after reporting a case in which creosote had done no good and antistreptococcic serum had been advantageous, I said, (4) "This case points to the probability in the future of the findings of the microscope being made use of as a basis of treatment."

Five years after beginning the creosote treatment I became acquainted with Collargolum, or Colloid Silver, in the form of Ung. Crede, a fifteen per cent ointment, which I used in many forms of sepsis. This I began using in broncho-pneumonia of children, a large per cent of which, Holt says, are of mixed infection. The results were so satisfactory that the treatment has been continued. In 1904, I began the use of Collargolum by the mouth and rectum, having prior to that time depended on its absorption from the ointment through the skin. The use of this remedy in pneumonia has so grown on me that most cases of pneumonia or bronchitis in children coming in my practice are treated with some creosote preparation and Collargolum jointly. I also treat a considerable proportion of my adult cases in this manner. This treatment has resulted in a very small mortality, and, as a rule, very short cases. The effects in some cases have been very remarkable, or the coincidences equally so.

Sol S., negro man, had been sick with pneumonia about ten days; was an uneasy, restless case, getting almost no sleep, though several hypnotics had been used. He had been treated with creosote carbonate with no good results. He was given ten grains of Collargolum by enema in the afternoon. The next morning, though there had been no decline in his fever, he said he felt "good," and had rested well without a hypnotic. The dose was repeated nightly, and in a few days the fever was gone. Collargolum was then discontinued. The creosote was continued, as the physical signs indicated a continuance of the disease in the posterior part of the right lung. The disease had been limited to that part from the beginning. In two or three days, the fever began gradually to ascend. Collargolum was then resumed, this time by the mouth. It did not give such sharp results as to temperature as on first administration. The temperature fell gradually. With the administration of the collargolum came a sense of well being, and a most remarkable appetite and digestion. The patient ate like a laboring man, and nothing disagreed with him. He gained ten or fifteen pounds in weight, and came to my office ahead of a promised visit, two days after the cessation of fever, and was ready to go to work in a few days. He was sick in bed about a month.

January 15, 1910, was called in consultation to a baby about a year old. It had been sick with broncho-pneumonia about two weeks. Temperature had fluctuated from 100 or 101 to 105, the rises being sometimes quite rapid. The child had been given creosote carbonate until it had become repugnant to it. Guaiacol carbonate was substituted, and being a tasteless powder, it was mixed with

sugar and put into the baby's mouth just before nursing. Ung. Crede was rubbed in freely. That night the temperature rose quite high, but by the next afternoon it was normal or below. There were a few slight rises thereafter.

S. Solis Cohen, who, as a member of a committee of the Council on Pharmacy and Chemistry of the A. M. A., gave a favorable minority report, his co-members giving an unfavorable majority report, on Collargolum, speaks highly of it in broncho-pneumonia.

Of pneumonia, Dr. Stachowsky, of Austria, after reporting sixteen cases "treated" with good results, says:

"In some cases, the Collargolum did not seem to have the desired effect, and the reason for this is a decided argument in favor of greater exactitude in the bacterial diagnosis of the disease. . . . It seems probable that in lung inflammation, in which the ordinary pus organisms are active, the silver is more effective than in the pure diplococcus pneumonia. . . . It is appropriate in all acute infectious processes where the ordinary pus cocci are the chief noxious agents.

Dr. G. Bjorkman, Professor of Physiology, Milwaukee Medical College, says regarding the treatment of broncho-pneumonia:

"The bacterial trio—the streptococcus, the staphylococcus and the pneumococcus—is the main cause of broncho-pneumonia. Fortunately, we have a remedy with very active offensive properties to all three of them, especially the streptococcus, which de facto is the sole instigator of the most severe type of broncho-pneumonia. This remedy is colloidal silver in solution, by intravenous or rectal injection. It is remarkable to note the speedy descent of the fever curve. With a morning and night dose, given per rectum, in combination with hydrotherapy, broncho-pneumonia loses it foothold at once and yields with a willingness comparable only to diphtheria under antitoxin treatment. Collargolum, therefore, should always be resorted to, even when a case seems almost hopeless, and beyond the reach of common therapeutics. The remedy should be administered a sufficiently long time after convalescence to guard against relapse and untoward sequelae."

Under "Lobar Pneumonia," Prof. Bjorkman states:

"What was said concerning soluble silver under broncho-pneumonia holds good in every respect in regard to lobar pneumonia. Even if direct action on the pneumococcus in certain cases is less conspicuous, the visible mitigation of symbiosis or mixed infection (strepto- and staphylococcus) under the influence of silver is important enough to make this method an indispensable adjuvant in the treatment of severe cases of lobar pneumonia."

Dieulafoy, in his recent work on practice, recommends Collargolum in pneumonia.

I would sum up my treatment of pneumonia and bronchitis as follows:

Give a creosote preparation freely from the beginning in all cases. Use Collargolum in all cases of small children, preferably by inunction. There may be some who do not need it, but it will do no harm.

In cases of older persons, where there is a suspicion of an infection other than of pneumococcus, use it also.

Do not understand that I *never* use anything but these specifics. Most frequently I do not, but keep a constant watch as to the necessity for anodynes, stimulants, etc., and use them when I deem them necessary.

Mention has been made in this paper of the use of antistreptococcus serum with apparent good results. The general reports of serum in pneumonia have not been encouraging, not at all to be compared with its use in diphtheria or meningitis. The reason of this is that in each case of these two diseases we have a single specific micro-organism to contend with, while not infrequently in pulmonary infection the organisms are multiple and various.

This fact has been recognized by the serum makers, and as a result we have the multivalent serum, a little of this, that and the other. However, I have seen no report of serum treatment that will compare at all favorably with my own work, or the statistics given above, besides my patients are spared the pain of hypodermic injection and the risk of serum sickness.

As Collargolum, above recommended, seems to be but little known to the profession, I take the liberty of offering a few remarks, particularly as to mode of administration.

I have been using the remedy for fourteen

years, and think it covers more territory in sepsis than any known remedy. How it acts I do not know, for experimenters in vitro say that it is neither bactericidal nor antiseptic. It has been suggested that it, in common with other colloidal metals, as gold and platinum, on account of the extremely minutely divided condition in which it enters the blood, acts as a ferment, or unites with other colloid substances, the toxins thereby destroying them. It is also said to enormously increase the leucocytes. This matter of its manner of action is still sub judice.

For five years, for the constitutional effect of Collargolum, I relied on rubbing in the ointment, and this I still consider the most satisfactory way of giving it to small children. When the skin is hot and dry it is taken up very rapidly.

By enema. First wash out the bowel, and when it has become quiet inject ten or fifteen grains dissolved in four ounces of warm water once or twice daily. If necessary, an opiate may be used to counteract the irritability of the bowel and assist retention.

By mouth. Much greater care is required than in other methods, because of the sensitiveness of the Collargolum to the influence of acids. It has been my aim to devise a method by which the silver may be carried through the stomach into the alkaline intestine without acid contamination, also to avoid such contamination before administration.

I write:

"℞ Collargolum, grains 20 to 50.
Sodii Bicarb., grains 2 to 4.
Aquae Dest., ounces 2.

M. Sig.—Tea or dessertspoonful on an *empty stomach* 3 to 12 times a day, followed by a glass of alkaline water."

Where only liquid diet (not sweet milk) is being taken, I say, "No food for two hours before or one hour after medicine."

The remedy may also be taken in capsules, in which case it is best to take a small drink of water at the time of taking and a large one about fifteen minutes later, when the capsule has had time to dissolve.

REFERENCES.

(1) N. Y. Medical Record, October 18, 1902.
(2) Southern Practitioner, December, 1901.
(3) Texas Courier-Record of Medicine, November, 1898.
(4) Texas Medical Gazette, October, 1904.

DISCUSSION.

Dr. W. W. Harper, Selma, Ala.—In the month of August it was my pleasure to learn something of the work that is being done by Professor Morgenroth in Berlin. He was at that time conducting a series of experiments with a drug that has a quinine derivative. Its name is "optochinum." In a series of cases of pure pneumococcic infection he used the drug and had practically a perfect result in every case. In this series of experiments, in every case where he had pure pneumococcic infection and the drug was administered within forty-eight hours, every patient recovered in from twenty-four to forty-eight hours. I attempted to get some of the medicine at the time, but could not. Last Sunday I received a letter from Professor Morgenroth, who notified me that in a few weeks it would be on the European market under the trade name. It is a long technical name. The drug is administered very much like salvarsan. The cases must be pure pneumococcus infection and the drug must be administered within forty-eight hours. Professor Morgenrotn has been using it since August in the general hospital in Berlin with most gratifying results. I do not believe myself that this drug will be on the market before the first of December, but the results coming from him, who is a well recognized German authority, places the treatment upon a sure scientific basis in cases of pure pneumococcic infection.

Dr. I. L. Van Zandt, Fort Worth, Tex. (closing the discussion)—I am especially glad to hear this statement from Dr. Harper with regard to this new drug. He agrees with me that pneumonia is curable.

Some six or seven years ago I read a paper before our State Medical Association in which I made a plea for specific medication, and whenever I hear of a new specific for the treatment of any disease, I feel like patting myself on the back and saying, let it go forward. Let us hunt for specifics and when the disease is diagnosed, then we may have a remedy.

ADDRESS OF THE CHAIRMAN, SECTION ON PREVENTIVE MEDICINE AND HYGIENE.*

By Dr. Joseph Y. Porter,
Jacksonville, Fla.

In bidding you welcome to the Section of Preventive Medicine, permit me to express my appreciation and gratification at the goodly number present. It is reasonable that we should expect to have with us health officers and members of Boards of Health, nevertheless, it is likewise gratifying to see that there are many here whose chosen line of professional study does not particularly direct thought to subjects which are only discussed in a gathering of this character. It is a matter of great gratification to note the interest, which is yearly increasing, in the subject of preventive medicine, and more than this, the universal acknowledgement by the laity that to prevent sickness is equaly as noble and Christlike a calling as it is to cure; a paradoxical admission, it is true, to the usual conception of the layman, who views this activity of the doctors "as working themselves out of a job." This is not true, however, and may be said to be a positive contradiction, for in well governed communities, where sanitary requirements are rigidly enforced and followed by the people the medical practitioner thrives better financially than where little or no heed is given to tenets for good health.

So, after all, the sanitarian and the general practitioner of medicine have no differences to meet or harmonize, in the method of each to earn a livelihood, for in their own peculiar way they are aiding humanity by helping to prolong life.

I, therefore, bid you, one and all, a cordial welcome to this Section, earnestly praying that your deliberations may result in great good, and that by insisting upon practical application of ideas and principles which have been gained by experience and investigation, we may retain the confidence we have inspired, in what we have taught, and to so continue to teach in the future, that the most ignorant cannot fail to imbibe a few truths; seeds, as it were, dropped by the wayside to spring up to fruitful harvest in years to come. For, my co-laborers, we are not working solely for the good of the present generation, for it is in the future "coming forth" of men and women that the optimist in sanitation hopes and looks forward to a realization of cherished ideals. It is a homely adage, but a true one, that: "it is difficult to teach old dogs new tricks," and it is equally true that in the application of this saw we can scarcely hope, in the older persons, to overcome all of the false notions or prejudices, or whatever term you may choose to call them, of the fixed ideas of the "grown-ups" of today, which in early life they imbibed. It is from their children that we hope for future good results of our teaching of today.

The past year has yielded a fairly good harvest in practical methods, and I may say, discoveries, which contribute to the health and benefit of the human family. The United States Public Health Service, always active and always alert, has subscribed in a large measure to the advancement of the cause. Its officers have answered appeals from the States where help has been asked for, to investigate outbreaks of sickness which required more time and a greater attention to detail work than the average health officer of a municipality could give. The published findings of these studies have been interesting, and what is more, greatly instructive. I think that we all will voice our appreciation of the help which we have derived from this Service. The States themselves, especially those connected with our own Association, have not been tardy in pushing measures tending to advance the health interest of the human family; and by press service, literature on special subjects, and by bulletins and monographs, State and municipal

*Read by title in Section on Hygiene and Preventive Medicine, Souhtern Medical Association, seventh annual meeting, Lexington, Ky., Nov. 17-20, 1913.

organizations have circulated useful and practical information on methods and measures to preserve health and prevent sickness.

It is believed that a better condition of sanitation throughout the Southern States has resulted from these educational methods. I know that this is true as regards my own State, Florida, for never in the history of this State has there been such an active interest manifested in health matters as at the present time, and this interest is not one of mere curiosity to gratify an inquisitiveness into the unusual; but a real desire to obtain information on subjects of practical methods of healthful living, which will be to the advantage of both the individual and the community. When the people begin to ask questions, and to show an eagerness for information on this or that subject relating to rightful and proper living, then the health officer is encouraged in his efforts, and with increased enthusiasm tries to present more forcefully, sanitary facts which experience has proven to be effective and fruitful, and consequently of lasting benefit. An inquiring community is sure to be composed of an intelligent group of thoughtful citizens, especially so as regards matters which affect the health of themselves or their families, and I may add, too, the general welfare interest of the business of the city, town or section of the country. A community of this kind fills the health officer with zeal and enthusiasm in his work and stimulates his faculties to a still greater endeavor.

It is the attitude of the indifferent and apathetic community which sends a chill down the spinal column of the health officer. A community which treats the whole subject of sanitation as a fad of the doctors, and does not believe in germs and "such like nonsense," is a difficult proposition, and a discouraging problem for the health officer to deal with: A community that insists that malaria comes from a miasm, and that mosquitoes have nothing to do with chills and fever; who, if considering the subject of health at all, construes sloth and civic indifference to appearances as indicating sanitary nuisances, or matters conducing to ill health, and ignores the weightier matters of typoid prevention. Communities of this description dishearten all efforts for their welfare or health betterment.

When small communities aspire to city airs, actuated by a wish for police protection as well as pride of locality, the citizens usually organize as a municipality with the various offices pertaining to such a government. Very often, the prime motive which prompts such action is called into existence by a feeling on the part of thoughtful citizens of the place that if sanitary conditions are to be bettered, then some form of government is absolutely needed to enforce any requirements of healthful living. But very often the mistake is made by a sanitary committee of a council, or the health officer, if one should be appointed, to think it their duty to indulge in theory of disease, and disease producing agents, rather than to appreciate those causes of possible sickness which lie almost immediately under their eyes. Again, too, unsightliness and litter are confounded with, or thought to be, sanitary nuisances, but they are not, for such carelessness is in no way inimical to health.

Theorizing on matters pertaining to sanitation, grasping at the shadow and letting go the substance, gains nothing in the way of confidence of the people or of practical benefit to the individual or community, but does earn for the health officer a reputation of being a visionist and an unsafe teacher. In a period of forty-odd years, engaged in health work, I have run up against many of these kind of men who, although anxious to do their duty, seem to think that they cannot accomplish the full quota of work and earn their little stipend (because health officers, as a rule, are the poorest paid of any of the city officials for the amount of genuine hard work they do) unless they are working out some speculative idea in sanitation or chasing a rainbow of impossible cause of disturbed health in the community in which they live. And not only do inexperienced health officers make the mistake

of entertaining fads, but the solid men of the town or community, as Councilmen, will wrangle and dispute over trivial matters, such as cutting weeds to destroy a thought-to-be miasma producing malaria, when a weightier subject, such as preventing a spread of typhoid fever by screening surface closets against flies, gives them no uneasiness or concern. One would think that in this age of scientific progress that a case of leprosy or smallpox would scarcely disturb the placidity of the waters of a well directed health organization, but is it so? Do we not every day see communities become excited over either one or the other on the slightest pretext or occasion, and what is more to be deplored and condemned, vociferously demand a quarantine against such persons, forgetting that in the case of smallpox and diphtheria absolute immunity is given by vaccination and by the use of antitoxin, and furthermore, that leprosy is only slightly contagious?

As much as I regret to say so, too many health officers give encouragement to such crude and false ideas and notions. Moreover, I am inclined to believe that too much importance of late has been given for a purely theoretical advantage to the cause of public health, to the supposed "carriers" of certain diseases, those persons who otherwise in health, have certain disease germs in their system, and I would sound a note of warning against too great a popularizing of this idea. I am not disputing the fact that there are individuals who harbor in their bodies certain disease germs; but if, at the same time, they show no clinical symptom of the disease of which these germs are the distinguishing feature, the query to my mind is this: "Are these germs always virulently active and a source of danger to those who may come in contact with such individuals, who are otherwise healthy?" Theoretically, and if obeying the dictum of the laboratory, these individuals should be isolated even when accidentally met with, and excluded from public places and the rest of well mankind. Practically, is this a sensible and reasonable procedure? Is it possible, or will it be to the advantage of the cause of public health, to enforce such a rule? When it is estimated that in the city of Washington, D. C., alone, the number of typhoid carriers reaches approximately three hundred, and more, who are not known, and who can never be detected except by accident; and that in the great city of New York, based on population, it is also estimated that there are about ten thousand carriers of typhoid walking the streets, plying their usual occupations, and totally unconscious of being a menace to public health, it can plainly be seen that to segregate or isolate one or two of such cases will be very much like guarding the spigot while the bung-hole is open. As I understand the present day teaching in this respect, bacteriologists, basing their opinions altogether on their laboratory findings and doctrinal teachings, would seemingly exclude every individual having a diphtheria bacillus in the mouth or throat, from general mingling with the public, irrespective of clinical or epidemiological history. Practically, and in everyday life and living, this will be found an impossible procedure, and it would seem to be unsound teaching, because it has been found that an examination of the throats of individuals taken haphazard, in a large percentage of cases, will show the presence of diphtheria bacilli, without any clinical symptoms being present or the individuals themselves being aware of the fact, or experiencing any discomfort or in the slightest degree cognizant of being otherwise than in perfectly good health.

I am not so certain, and in fact very much doubt, whether the germs of some diseases are without certain morphological changes, capable of an infectivity in other persons, which will produce the pathological phenomena resulting in clinical symptoms, especially denotive of the particular deviation from normal health. Perhaps I do not make myself quite as clear in this statement as I would like to, and if said in another way it will be: That certain bacilli which we consider pathogenic when found in persons otherwise healthy, and having no clinical evidence of the disease of which these

germs are thought to be productive, are harmless except under conditions which a specific action induced by a lowered condition of the vital force of the individual may call into play. Whatever may be the reason, and speculative sanitation should not be considered, I am opposed to any unnecessary inconveniencing of the public, entailing oftentimes hardships and expense, when the public health will not be materially guarded thereby.

I very much doubt, too, whether the campaign against the common drinking cup as the means or cause of spreading disease is based upon actual facts obtained by experience, and is not a speculative menace in a great measure. If the purpose of the ban now placed upon the common drinking cup is to promote cleanliness and decency, and is to be an educational measure in that direction, then I am heart and soul with the movement. The evidence of disease contamination by the common drinking cup is lacking to a great degree. Certainly as regards tuberculosis, because the Secretary of the Anti-Tuberculosis Association of the United States writes me, there are no records in his office of the disease ever having been propagated or spread by the use of the common drinking cup. A search of literature elsewhere gives the same negative finding. If the vessel is washed out and cleansed after each using I fail to see the danger lurking in its use that does not also hold good for drinking vessels in hotels, restaurants or homes after they have been used and cleansed.

I may be voicing a heresy for which I shall be criticised, and maybe lose my "union card," but believing in practical sanitation and in the application of reasonable and rational methods for the preservation of health which an intelligent public will accept and adopt, and not class as a fad, I cannot subscribe to impracticable methods based too often on speculation and theory.

Just a word more, because I do not intend that this paper shall be more than a welcome and a presentation of some thoughts for the Section to think over—accept or reject in their wisdom. It is, indeed, a matter for devout thankfulness to note the interest which yearly is increasing in efforts towards suppressing tuberculosis in this country, especially that form of the disease generally known as "pulmonary consumption." Organizations for this purpose, national, State and local, have done an immense amount of good work in this direction, and statistics show that if only a slight decrease in number of cases and mortality can be claimed because of these efforts still the disease is not on the increase, and the general conditions for control seem to be more promising. What I would direct your attention to in connection with the management of this disease is the difference in manner of management which must be followed in the different sections of this vast country. A method followed in the colder sections of the United States is totally unsuited for the warmer latitudes, and as this Association is composed mainly of Southern medical men, I wish to suggest this thought: That whatever of good or of possible benefit we may hope to give the consumptives of our section, it must be obtained from the open air treatment altogether, and in this particular the country south of Mason and Dixon's line is better adapted for the undertaking than the more Northern climates. I believe that sanitaria for consumptives must be of the open air construction to be of any material benefit either in prolongation of life, promoting a more comfortable existence or the hope of possible cure, and I am opposed to buildings of brick or of wood for the purpose. These are nothing more than hospitals for the treatment of this class of sufferers. Sanitaria projected on the general plan of the Fort Stanton system of tent houses, where the patient virtually lives in the open air, are better calculated to do good—make conditions more comfortable and to hold out a hope of permanent benefit.

Brick and wooden constructed buildings for treatment of this class are little more than hotels for the well-to-do, and cheap boarding houses for the poorer class. They are places

for seclusion and segregation of those whose affliction will not in one instance admit them to fashionable tourists' resorts, and in the other instance, poor farm institutions for the indigent "down and outs." In my opinion, neither are efficient or effective of good to the unfortunates who are forced to enter them.

I have noticed in my reading quite recently that in Massachusetts there is a disposition to suspend the construction of any more sanitaria for the indigent class suffering from pulmonary tuberculosis, on the ground that it is impossible to gather in all who are suffering, and that those who are unknown and uncontrolled by the State are creating conditions which it is impossible to counteract, and that the expense, therefore, of maintaining tuberculosis sanitaria is vastly out of proportion to any benefit which can be hoped to be gained in the construction of additional buildings for this purpose.

Just here let me pause to read you what Dr. Henry P. Walcott, Chairman of the State Board of Health of that State, is reported as having lately given expression to:

"Henry P. Walcott, Chairman of the State Board of Health, put a quietus on all further talk about 'compulsory isolation' of consumptives in sanitoria in Massachusetts by pointing out yesterday to the Recess Committee on Tuberculosis that there are at least 40,000 cases of identified tuberculosis in this State. The impossibility of attempting to treat all those cases, with perhaps 30,000 other cases of suspected infection, in State sanatoria, was self-evident. Dr. Walcott also made it plain that the present State law leaves it wholly to the discretion of the State Board when, if ever, a city or town shall be ordered to build a sanatorium, and also that it is only upon the direct refusal of a city or town to comply with an order that any penalty can be imposed. Inasmuch as no time is specified in the law within which a city or town shall build, it is clear that unless it can be shown to the courts that a community has 'refused' or 'neglected' to build, after a specified order, the present law imposes no penalty.

"On the whole, the testimony of the State's greatest expert was very damaging to the cause of the advocates of 'compulsory isolation.' After Dr. Walcott had completed his testimony the scheme for crowding a large percentage of the population into sanatoria appeared both ridiculous and hysterical."

Open air sanitaria require large areas and landed reservations to accommodate races and sexes, with additional space to devote to mild and moderate exercise and occupation in horticultural or agricultural employment. I believe agreeable occupation to be an important factor of treatment. Those who are physically able should be given gentle occupation, for the treatment of pulmonary tuberculosis is, and must be, both psychological as well as material if decided benefit is looked for. It is in a great measure for this reason that I am opposed to hospitals—for that is all the house sanitarium is—for the care of the pulmonary tuberculous. In the outdoor management of these cases the patient is given, or offered, agreeable occupation without undue exertion, and at the same time a diversion of mental faculties from his own trouble and anxiety. There is in the open or outdoor treatment an opportunity to get away from that distress of mind which constantly hangs over the head of each sufferer, and in so doing the opportunity for reciting to each other the distresses which oftentimes are greatly exaggerated and dwelt upon, are lessened. Without mental occupation and diversion systematically applied, with, of course, good food and an abundance of space for lung exercise, I am doubtful of any benefit which can be gained elsewhere or anywhere by the consumptive.

Where it is not possible for the State to provide ample space for the needed accommodation of races and sexes in an open air sanitarium for the indigent cases—for it is only this class that the taxpayers can be called upon to provide for, and then only on the ground that

unprovided for they are a serious menace to the health of the rest of society—then I am of the opinion that the State or municipality had better abandon altogether the idea of sanitaria, or a general sanitarium, and substitute therefor a corps of trained nurses, to travel the State, hunt out the pulmonary consumptive, and by advice and continuous assistance, teach the individual sick one, as well as the other members of the family, in methods best adapted to present conditions, which will aid the sufferer to more comfort, and perhaps ultimate cure, and at the same time protect the other members of the family from contagion. In the long run, I believe that this system will prove to be more effective in helpfulness to the consumptive and a decidedly more economical method of rendering assistance. In the rural districts the open air treatment of pulmonary consumption can easily be carried out under proper instruction if the individual is willing to be taught and will follow advice. A floored tent some little distance from the home building, comfortably fitted up so as to be homelike in appointments, and under the supervision of the visiting nurse, is all that is necessary in the way of outdoor requirements, for palatable food can be served from the home and without danger to the health of other members of the family. They can, under proper and well observed conditions, be companionable to the invalid loved one, thus robbing the partial isolation of homesickness, the curse which falls upon all those suffering from this disease who are separated from relatives and friends. May I ask you to seriously consider this proposition? Calculate the expense and compare it with the cost of maintaining a large sanitarium on the open air plan. I have no data on hand to offer you in this line, but my opinion is, that at the end of five years it will be found that more sick of this disease have been reached and benefited by advice and practical training than could have been gathered together in a hospital, or even in an open air institution, and with this advantage, that they will not be separated from loved ones and the companionship of those who help to make life agreeable while it lasts. Neither do I believe that under the instruction which will be given by a nurse of the corps such as I have outlined the duties of, that the presence of the individual sufferer will be a menace to the rest of the family. I am looking forward to Florida taking a positive stand in this direction within the next twelve months by inaugurating a system such as I have suggested, and hope to be able to also give you a favorable report on the utility of the measure when we next meet.

At the last meeting of the Southern Medical Association, in Jacksonville, I had the pleasure of expressing to the Section on Hygiene and Preventive Medicine some views that I entertained in regard to practical sanitation; things people should know and be taught, and contrarywise, what their minds should be disabused of, concernig false ideas and antique notions. Now, with your permission, I propose to continue this line of thought because I believe no more important work can be done by the health officer of today than to teach practical and common sense methods in sanitary management, and to emphasize especially the advantage which education and educational measures will have in spreading this knowledge among the people. Even at the risk of ringing a chestnut bell on myself and becoming tiresome in repeated pleading for this most important manner of diffusing useful information to the public, I feel, nevertheless, that in addressing this Section of Preventive Medicine I can do no better service to the Association at large, or to offer the individual members and attendants on this Section better advice than to impress upon them this truth, that the health officer, to command the confidence of a community and the respect of the citizens, must be practical in his views and unmistakably clear in the manner in which he expresses them. Principles of sanitary knowledge lie fundamentally in cleanliness; it is the keynote by which the arch of general healthful living is firmly supported. Without strict attention to these tenets the whole structure of sanitation must fall. It can

be seen, therefore, that to be successful in helping a community or any of its citizens, and directing them how to avoid conditions which impair health or health conditions, the health officer must be a close student of human nature with senses so acute that each individual case or individual himself can be analyzed for such needed attention, counsel or advice, as his temperament ostensibly requires. Neither communities nor citizens will place their faith in theoretical health officers, and the general public is right in thereby withholding their trust. for there is certainly enough to be done and worked out on this earth without seeking for problems in the clouds.

The distinguished health officer of Winnipeg very truthfully says: "No sanitary improvement worth the name will be effective, whatever acts you pass or whatever powers you confer on public officers, unless you create an intelligent interest in the public mind."

So it is apparent that faith and confidence in the clear-headedness of sanitary teachers must first be learned before the public will accept from them any instructon or teachings.

The whole question, therefore, of public health hinges upon the individual in his relation to society. Effort should be made to impress this fact, that the individual is responsible not only to himself, but to the community in which he lives; has an obligation to fulfill to his neighbor, and that too much dependence should not be placed upon the parental authority or assistance of government, either of State or nation, to correct errors of living which the individual himself can easily overcome by exercising common sense and reason.

Simmered down, the dogmas of healthful living find their birth in education, and any future benefit to the human kind, whatever it may be, which sanitarians hope to bring about, must come from correct impressions made on children in their education, and the school room must be the soil in which the seeds of this knowledge are to be sown.

My distinguished predecessor, Dr. Dowling, as Chairman of this Section, has done more in his State to bring about a clearer conception of hygienic requirements than could have been effected by tons of distributed literature. The eye will take in and receive impressions that will be lasting and will be remembered which the ear oftentimes fails to appreciate the importance of, and it is by means, such as he employs, pictures graphically shown upon the screen, charts, models, and clearly represented facts, which explain in themselves more emphatically than one can tell of, that we may expect the future improvement of the race.

The moving picture reels showing the disgusting habits of the fly, the evolution of malaria and filaria, and other parasites of the mosquito are educational methods which impress the thinking observer, and are important lessons which, when seen are learned, not soon to be forgotten.

In a cursory, and perhaps disjointed way, I have tried in my suggestions to point out the great need of practically applying our knowledge of sanitary science. In dealing with the public what we positively know about preserving health or preventing disease or destroying disease agents, let us tell, and explain, and take the public into our confidence concerning, all that we really do know, but by all means avoid speculation and theorizing, for nothing destroys faith in a health officer's judgment so much as a wavering and unstable opinion based on speculation and theory. I have purposely embraced in this argument two disputed methods of disease transmission because, as a menace to health and to the well, there is much conjecture and guess work. No one can confidently state that bacilli carriers in a non-virulent state, and without producing clinical symptoms, are capable of creating in a well and non-carrier person the peculiar disease of which they stand as a type, and the evidence is wanting likewise, so far as the common drinking cup is concerned. To exclude both on the common ground of "injurious to health" without proof is to seriously inconvenience the public in its freedom of action. After all is said and done. human nature is and always will be human

nature to the end of time, and although easily moulded to public opinion, when rationally presented with facts, yet, when the curtailment of rights is asked for by the sanitarian, and the request is based merely upon supposition and theory, then this same yielding public becomes adamantine in opposition and loses faith in the correctness of judgment and wisdom of the would-be teacher. Therefore, if the advice of one who has been engaged in this work for nearly half a century is worth considering, I say to you, be practical in methods which you offer as safeguards of the public health. In other words and homely said: "Keep both feet on the ground."

HEMOSTASIS DURING AND FOLLOWING TONSILLECTOMY.*

By Homer Dupuy, A.M., M.D.
New Orleans, La.

The question of hemorrhage in tonsillectomy, like the ghost of Banquo, will not down. Removal of the tonsil with its capsule intact, better operative technic, more efficient surgical instruments, should reduce the possibility of excessive hemorrhage. We may tax our technical skill and our mechanical ingenuity to its utmost, there will yet remain such factors as anomalous vascular distributions, abnormally large vessels, delayed coagulation of the blood, and regional handicaps, which will render it possible for severe bleeding to follow this operation.

VASCULAR SUPPLY.

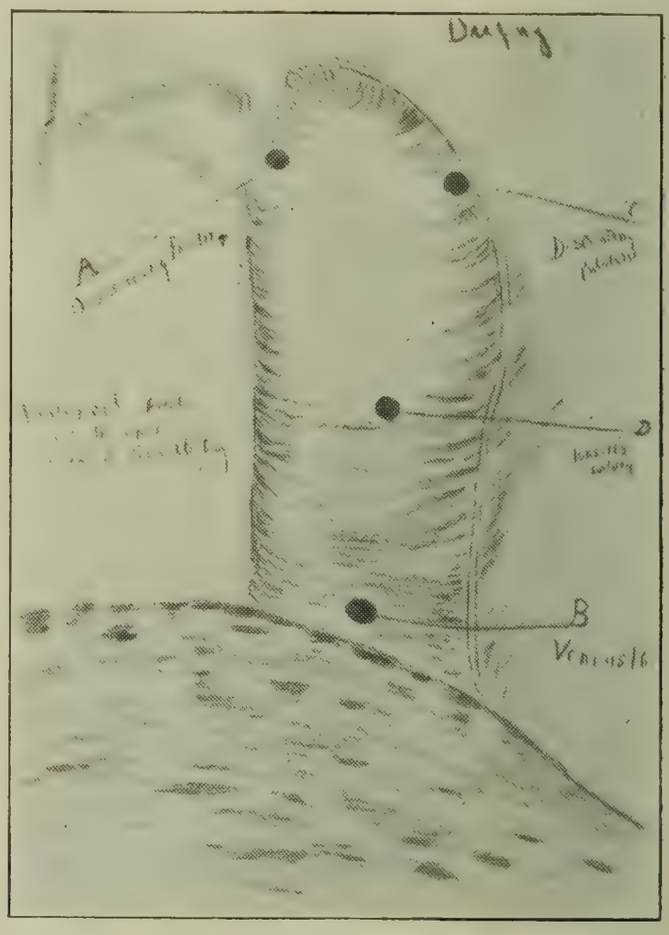
Let me briefly recall the salient anatomical features in the vascular supply of the faucial tonsil.

The supply is furnished by (1) the tonsilar branch of the facial artery; (2) the ascending pharyngeal, a branch of the external carotid; (3) the ascending palatine, a direct branch of the facial; (4) the descending palatine, a branch of the internal maxillary; (5) the dorsalis linguae, a branch of the lingual.

The veins terminate in a plexus to the outer side of the tonsil, from which the blood is carried out by the internal jugular and facial veins.

This is a generous vascular supply, and from the viewpoint of surgical anatomy it is of practical importance to stress the following observations:

(a) There is a free anastomosis between the vessels supplying the tonsils. The ascending and descending palatines arteries would seem to be especially concerned in this anastomosis.



(b) The tonsilar branch of the facial artery is regarded by most observers as the chief vessel of supply to the tonsil. My own observations give the descending palatine a second place, as it gives off two branches for distribution in the anterior and posterior pillars. Corresponding to this distribution the upper

*Read in Section on Ophthalmology, Rhinology, Otology and Larnygology at the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

two-thirds of both pillars are points frequently showing spurters during tonsillectomy.

(c) Normally the trunk of the ascending pharyngeal and tonsillar arteries lie to the outer side of the tonsil. The former is nearer the tonsil than any of the main trunks, and is, therefore, exposed to injury at the hands of the "slashing" operator.

(d) The superior constrictor muscle, forming the external wall of the tonsillar fossa, is pierced by the tonsilar artery, also by the branch of the ascending pharyngeal.

(e) Usually it is just external to the fibrous capsule of the tonsil that these vessels further subdivide into smaller branches, which separately enter the tonsil proper for regional distribution.

(f) As the superior constrictor, palato-glossus, and palato-pharyngeus muscles form the outer, anterior and posterior boundaries of the tonsillar fossa, these walls of muscle tissue enclose the larger branches of the tonsil arterial supply.

SITES OF BLEEDING.

My personal observations in the clinics of the Charity Hospital and in private practice relative to the bleeding points during tonsillectomy, with an apparently normal vascular distribution, have resulted in the following conclusions:

1. The upper two-thirds of the posterior pillar near its junction with the soft palate is the most frequent site of bleeding.

2. About the middle of the tonsillar fossa is the second most frequent site of bleeding.

3. The lower two-thirds of the fossa, a point corresponding to the venous plexus of the tonsil, is third in frequency.

4. A spurter is sometimes encountered along the upper two-thirds of the anterior pillar.

5. The inferior portion of the fossa, which is supplied by branches of the dorsalis linguae, is not infrequently the source of very troublesome bleeding.

6. The lingual tonsil not infrequently projects into the tonsillar fossa just beneath the body of the faucial tonsil, where its injury causes stubborn oozing, the source of the bleeding is the lingual tonsil branches of the dorsalis linguae.

It may be argued that in considering these possible bleeding points following extirpation of the tonsil, we are guilty of refinements without practical bearing. The reply is that the security we hope for after performing tonsillectomy, with little or no attention to hemostasis, places the great majority of us in the category of the man who, looking around for a congenial church, entered one and heard the minister announce this text: "We have done the things we should not have done and we have left undone the things we should have done." "Thank goodness," said the young man, "I have at last found my crowd."

HEMOSTASIS.

For the control of excessive bleeding during and following tonsillectomy we have run the gamut of chemical agents and instruments for compression. After a review of many text-books, from the older works to the modern ones, it seems incredible how few emphasize the efficiency of long artery forceps in grasping the bleeding vessel and the application of a ligature.

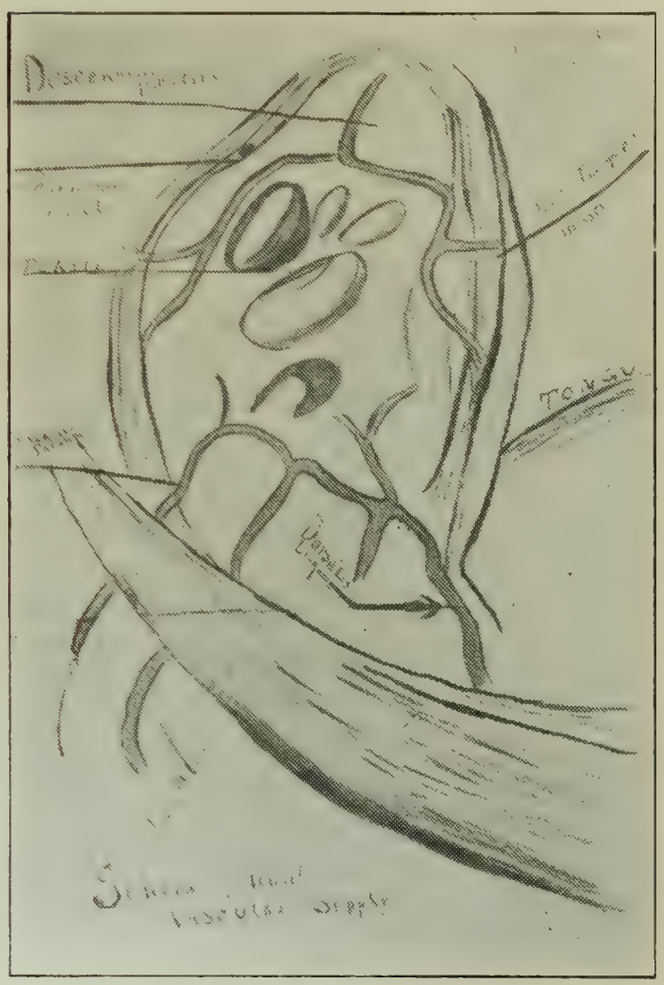
With the advent of an improved technic, which has placed tonsillectomy on a surgical basis, something more is demanded of us than the mere application of chemical agents for the production of a safe hemostasis in tonsillectomy.

The ligation of spurting vessels and the control of undue oozing at fixed points by this same method is to be regarded as the most efficient, and certainly the most surgical, way of arresting bleeding. In ligation we have the surest means of guarding against intercurrent and secondary hemorrhages.

Tonsillectomy completed, after controlling the general capillary bleeding by firm compression with a sponge, the field of operation is thoroughly inspected, every spurter in the field

is secured and ligated. Any excessive flow of blood rapidly reappearing at the same point after the application of pressure for two or three minutes calls for ligation. A large vessel visible in the fossa, though uninjured during the tonsillectomy, should be ligated with double ligatures, for in the event of post-operative sloughing in the wound this vessel could become a source of a late secondary hemorrhage.

The mere twisting and crushing of a spurter



should not replace the safer measure of ligation. Compression of the whole operated area should not be continued for over a few minutes, as it will only retard the bleeding, which may be manifested later by a spontaneous reopening of the vessels.

It must be admitted that children, whose tonsils usually present a predominance of lymphoid elements and a vascular supply of smaller caliber, are less subject to excessive bleeding. But in these young subjects secondary hemorrhages may prove serious as the child is more intractable to the application of hemostatic measures. The ounce of prevention can only be realized here by leaving nothing to chance and by, therefore, applying a ligature at every point showing persistent bleeding at the time of the operation.

In adults it is apparent that more ligatures are required. It is eminently good practice to apply, as a routine method, a ligature at a point corresponding to the upper two-thirds of the anterior pillar, and one at about the central portion of the fossa, where the tonsillar artery enters the tonsil. Thus far my observations tend to prove that these are two points showing the most excessive and persisting bleeding.

In intercurrent and in secondary hemorrhages in children, search for the bleeding point under general anesthesia. Remove the clot, catch the vessel with long hemostatic forceps (the Jackson forceps are invaluable for this purpose), and apply a catgut ligature. In capillary bleeding tuck up the tissues with a suture ligature with the object of including the whole bleeding area. In the rare instance of capillary bleeding from the surface of the whole operated field, pack the fossa with gauze previously soaked in tincture benzoine compound and bring the pillars together by purse-string sutures.

In the adult general anesthesia will seldom be required when applying these measures. But we should not hesitate to use it if the patient prove uncontrollable, for to arrest hemorrhage in this region by means of ligation deliberate and undisturbed action is essential. The use of the hemostatic tonsil clamp, or tonsil hemostat, will be lessened as we perfect our technic in the application of the ligature. The hemostat is a cumbersome instrument, is painful to the patient, and is capable of harm through the sloughing which frequently ensues from its application. In an emergency, however, awaiting the transfer of the patient to an operating room for inspection and liga-

tion, the clamps may prove invaluable. But for prolonged compression its use, I now believe, to be inadvisable and unsurgical.

With regard to chemical agents it must be admitted that a gargle or spray of hydrogen peroxide and water, equal parts, will frequently arrest moderate post-tonsillectomy bleeding. The salts of iron, tannic and gallic acids, adrenalin, have well nigh outlived their reputations and usefulness as safe hemostatic agents.

Evidently this contribution is an argument for ligation. So it is, and there is no valid argument against this method. The difficulty of applying ligatures in this rather inaccessible region will be greatly reduced with practice and with better technic.

Dupuy-Weiss Tonsil Ligature Needle. McDermott Inst. Co.

The ordinary straight needle-holder is positively inadequate. But already the throat surgeon and the instrument maker are presenting ingenious devices to meet our difficulty.

Awaiting the advent of a serology which will absolutely secure us against hemorrhages following tonsillectomy, ligation offers us the most certain and the most surgical means of controlling excessive bleeding in a field of surgery in which it might truly be said that the unprepared too often rush in "where angels fear to tread."

208 *Medical Building, New Orleans, La.*

DISCUSSION.

Dr. Dupuy.—The Dupuy-Weiss needle holder for tonsil work has proven very serviceable. The needle is fixed to the handle. There is one instrument for each side. The needle in taking up the bleeding area does not slip. We use catgut entirely, 00. I am not wedded to this particular instrument, but I am to the principle which it represents.

U. S. Bird, Tampa, Fla.—In beginning the discussion of this paper I want to express my appreciation of what has been done and to endorse the methods that have been presented. There is nothing I can add to the technique brought out. Within the last few weeks I have observed the technique in different clinics. In Ballenger's clinic the patient is removed from the operating room immediately after operating. I asked the methods of controlling hemorrhage. He said he did not expect any hemorrhage; any ordinary hemorrhage he controlled by the ice water gargle. In the Beck clinic was used the rubber tubing, passed through nose, out of mouth. They claim the use of this tube is sufficient to check ordinary hemorrhage. In the case he used it where the hemorrhage was not entirely checked, he used the tincture of benzoin on gauze by packing it between the pillars. He used one suture.

In St. Luke's Hospital I saw a very satisfactory operation in which the tonsil was removed with dissection and snare. There was free bleeding on the right side. The vessel was grasped the forceps twisted and removed. Bleeding persisting, the forceps were replaced. This technique differed from yours by not suturing the tissue. The suture was placed alongside the needle and tied —then passed the forceps over and tied it under the forceps, making two ligatures practically, which were anchored by the needle. The attitude of the profession is just a little mixed. I heard it discussed by several men, and one told me his practice was to ligate with the patient in the Rose position. Ballinger stated in the head's hanging down the bleeding persisted as long as the head hung down. A general surgeon said their practice was to grasp and ligate. He used the Murphy forceps. On the other hand, Richards' of Fall River, has stated he finds ligation a very difficult thing to do, and I understand does not do it. There is one thing I have had my attention called to. I think it has been stated that bleeding can be expected or not as the tonsil is freely or incom-

pletely removed. My experience has not borne that out. I remember a case I removed one tonsil, I got the tonsil dissected and very well loosened, but because of her nervousness we hurried, using a tonsillitome with no bleeding. The next tonsil I removed with blunt dissection and snare with troublesome hemorrhage. I think it is also stated in the old text-books that if the bleeding is allowed to persist until fainting results the bleeding stops spontaneously after the fainting is recovered from. I doubt if any of us care to watch it to that extent. I also incidentally heard of the use of serum in the control of hemorrhage. The interesting thing was the way it worked. Some man said he always used horse serum when hemorrhage persists; the effect was instant. I have had no experience with it. I also got some side information while we were waiting on our clinic. Some man had been in the habit of using some preparation with quinine and urea. He said he considered that as a practical assurance against bleeding. His formula was, Coc. 1-8 Q. and U. grs. 1 Ad. 1—1000 m x, N. S., to make two drachms. He injected this on all sides of the tonsil, making ten injections He said he had used it in over a hundred cases. Since he has done that he has never had any hemorrhage. I have used some of that myself, not exactly that formula. I never get any good results. I do not know just why but it was that way with me. However, I do not think there is any difficulty in applying it. The rational and surgical method is the one the paper laid down. At the same time I think I will have the Micknelic's forceps in case of emergency. They have done me good service at times, and I would feel at a loss without them. When in Chicago I saw Dr. LaForce demonstrating his tonsil instrument on gauze. It is a complicated affair, in which the tonsil is forced into the lumen of the instrument after the Sluder method. It is then crushed and transfixed by a threaded probe. The tonsil is then tied and cut off, leaving the crushed ligated lump. It does not appeal to me.

J. W. Jervey, Greenville, S. C.—This bugbear of tonsil hemorrhage comes up at every meeting when tonsils are discussed. I believe if you take the tonsil out clean the occurrence of hemorrhage is reduced to an almost insignificant minimum. I am surprised that Dr. Dupuy has found it necessary to demonstrate the grasping of a bleeding vessel in the tonsillar region with forceps. It seems to me all of us ought to be able to catch a bleeding vessel in the tonsillar fossa and tie it without the slightest trouble. Like Dr. Bird, I have heard Dr. Richards say on the floor of a large meeting that he has tried to tie such a vessel and that it was a difficult thing to do. Any man practicing laryngology ought to be unwilling to make such a statement. There is nothing difficult about it. If he is able to tie an artery in any other cavity of the human body he ought to be able to tie it in the tonsillar fossa. There is one thing that simplifies the situation. Dr. Bird speaks of Dr. Murphy's forceps. I am not familiar with it, but there is a forceps made about the size of this one (indicating), originated, I believe, by Dr. Rosenheim, of Baltimore. I have used it on a few occasions. There is a groove across the lower lip of the forceps. In that groove you lay a long catgut ligature and draw it up on each side of the forceps and catch it on the clamps provided for the purpose. You then have on the forceps the ligature ready for tying. You locate the bleeding point and you have the forceps all ready. Apply it and close it. Draw your ligature close, with one finger well back in the pharynx, and it is as simple a thing as ever suggested. Why Dr. Richards ever stated he had tried to ligate in this region and found it one of the most difficult things he ever found to do I am at a loss to understand. If we are careful to clean out the tonsillar fossa we are going to have very little trouble. At the same time we may be dealing with an oozing surface and not a spurting vessel. One of the simple things is to seize and twist a small bleeding vessel. Dr. Dupuy does not seem to approve of that method of controlling hemorrhage. I agree, in a spurting cessel it is not sufficient, but with a small oozing vessel it is sufficient.

I have had needles of this sort (indicating) in my office—not exactly on this principle, as Dr. Dupuy says these are original instruments with them in New Orleans, but very similar. The ones I have are made for suturing the uterine cervix, I believe. I procured them many years ago simply as a protection, thinking I might be called on to suture the tonsillar pillars, but I have never had to use them. I think these needles Dr. Dupuy has shown would be very practical and answer every purpose where the pillar has to be sutured. I have never had to do it.

J. B. Greene, Asheville, N. C.—This is a very timely paper. There are one or two points which occur to me. One is the secondary bleeding that occurs two or three hours after operation, particularly in adults, where cocaine is used. It would be a very difficult procedure to tie an artery in the tonsillar fossa of a sensitive, nervous woman. Those are the cases Dr. Richards or any one else would have trouble in tying. It is not in children, but in adults, where we use cocaine, that hemorrhage is most frequent.

Another point: The Wagner metallic clips, where you have bleeding in a gagging individual, can be put on the pillars very quickly and are effective.

W. Likely Simpson, Memphis, Tenn.—What is the percentage in which you will find it necessary to use this suture? I have not had a case of hemorrhage from the tonsil, neither at the time of nor secondary to the operation in the last two years. It seems to me the hemorrhage after tonsillectomy bears a very close relationship to the instrument used. If one uses a sharp cutting instrument, there wil be hemorrhages now and then.

Homer Dupuy, New Orleans, La.—No instrument has so far been devised, no method of operation presented, which will absolutely secure us against a possible hemorrhage in tonsillectomy. The much-lauded Beck instrument for a bloodless operation in my hands was only recently followed by a very serious post-tonsillectomy hemorrhage. Certainly we must admit that there are regional difficulties which present themselves in the application of ligatures in the tonsillar area, but they are not insurmountable. By pulling the posterior pillar towards the median line we get a better view of the tonsillar fossa and can better secure the bleeding points. Relative to the serum in the

prevention of hemorrhages, Dr. Goldstein's article, in a recent issue of the Laryngoscope, advises that the serum be given twenty-four hours before the operation. Our experience is yet too limited with the serum to warrant any practical conclusions. It is possibly uncomplimentary to our art to make the admission, but we are here for a frank discussion of the question, that the throat surgeon is too prone to treat the tonsillar area with regard to possible bleeding with the greatest indifference. As long as we must expect undue bleeding following the removal of tonsils, we should be prepared to cope with it in a thorough urgical manner. Ligation, in my experience, is the most certain and the most surgical means.

A FURTHER CONSIDERATION OF THE USE OF IODINE IN THE ABDOMEN.*

By J. A. Crisler, M.D., and Eugene J. Johnson, M.D.
Memphis, Tenn.

HISTORY.

In a paper read before the Surgical Section of the Southern Medical Association at Hattiesburg, Miss., in November, 1911, we stated the outlines of this innovation in the treatment of peritonitis and in another paper upon the same subject, read before the same association at Jacksonville, Fla., in November, 1912, and at the Tri-State Medical Association, which convened at Memphis during the same month, we again presented the subject to the profession together with the history of iodine treatment in our hands in combatting the peritonitides. These papers were published by the official organs of these associations. Up to this time we had used the treatment in over a thousand cases of peritoneal infections, comprising conditions running all the way from simple, walled-off appendiceal abscesses to those of acute, diffuse, suppurative peritonitis and general suppurative peritonitis covering a period of six and a half years, ending July 1, 1912. From July 20, 1912, to November 1, 1913, we have used iodine in the abdomen and pelvic peritoneal cavities one hundred and seventy-seven (177) times for the following conditions:

	Cases.
Pus in the free peritoneal cavity from appendiceal infections	51
Pus in the pelvis and lower abdominal peritoneal cavities from salpingo-ovarian infections	29
Pus in peritoneum from ruptured gall bladder infections	9
Walled off appendiceal abscess in which the free cavity was not contaminated	69
Typhoid perforation (forty-eight hours old)	1
Abscess of the mesocolon	2
Metastatic abscess of the liver	1
Abscess of the spleen	1
Traumatic rupture of the urinary bladder	1
Acute perforating ulcer of the stomach	2
Perforated ulcer of the duodenum	1
Traumatic rupture of the intestine from horse kick	2
Tubercular peritonitis, tubal origin	5
Tubercular peritonitis, appendiceal focus	3

TECHNIQUE.

We use a two and a half per cent solution of iodine in alcohol, undiluted, and as soon as the incision is made and the cavity reached, if pus is discovered free in the peritoneal cavity, this solution is poured in immediately so as to thoroughly flood the infected area before any attempt is made to liberate the pathology. By this means we have learned not to fear a spread of infection through mechanical means. The principal feature in this method is to make ourselves feel perfectly sure that the iodine reaches well beyond the area infected and also that we are operating in an immersed field, from which no further contamination can reach the healthy portion of the field without first coming in contact with the drug. The amount of the solution that we use is dependent upon the extent of peritoneal infection; that is to say, if the contamination is partially or completely localized, two or more ounces may be sufficient to flood the field and render the necessary service. If, however, there is a wide spread of infection or a diffuse, septic peritonitis, we retract the abdominal incision and elevate the parietes and literally pour the entire abdomen and pelvis full of this

*Read in Section on Surgery of the Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., November 17-20, 1913.

solution, taking great care to make sure that the drug reaches all of the fossae and recesses within the abdominal and pelvic cavities. This may require anywhere from eight to thirty-two ounces or more of the solution. After the pathology is dealt with we take large towel sponges and gently insert these into the most dependent fossae and gently mop out the excess solution and debris, avoiding scrubbing and trauma. Of course, in every case we employ the usual drainage, Fowler position and Murphy treatment. If there is profound toxemia we also use saline hypodermoclysis and when indicated intravenous saline transfusion in order to more rapidly eliminate the toxines.

OBJECT TO BE ATTAINED.

We are all familiar with nature's defensive elements that are primarily active in an infected area within the peritoneum. This defensive process is manifested by the abundant outpouring of leukocytes around the focus of infection, the object being to destroy the invading army of bacteria that have gained access to the peritoneum from the infected focus. These phagocytes are victorious in so long as they are able to encompass and combat a given number of the invading bacteria. In progressive cases, however, these soldiers of the blood are overcome and are no longer defensive, but become offensive in that they have been mastered by the virulent infecting organisms. A case may end by localization of the infective processes, provided the spread of infection is not too rapid and the resisting forces of the economy are in good fighting order. If this does not obtain, or if the localized abscess ruptures, we have a more general and extensive infection, which may go on to diffuse or even general suppurative peritonitis. These latter processes are evidences of a lost battle on the part of nature and a yielding of the victory to the infecting agents.

The object of the iodine treatment is to disinfect and destroy and terminate the ravages of the invading bacteria and give the fighting elements of nature a chance to successfully array themselves.

Our large experience in the use of this drug and the clinical manifestations after its use in these cases lead us to firmly and conscientiously believe that the infecting elements that are free in the cavity are at once destroyed and that the absorption of toxines, which, after all, is the *sine qua non* mortuary factor of peritonitis, is immediately terminated. Aside from the imediate sterilizing effect of the remedy upon the free surfaces and fluids, we believe that the lymph spaces are rendered incapable of further absorption of the toxines for many hours, while an outpouring of serum and new phagocytes is immediately encouraged. We are strengthened in this belief by the fact that the temperature in these cases almost invariably falls in a few hours from whatever it was down to normal or nearly normal. Also that there is an abundant serous drainage following the operation, which is in excess of the usual drainage following other methods. This tends to disgorge and in a measure wash out the subserous, cellular tissues, which may or may not also receive some beneficent, antiseptic effect through a process of osmosis directly from the iodine that has come in contact with the inflamed serosa.

ADVANTAGES OF THE IODINE TREATMENT.

The advantages of this method or any other method can only be estimated by faithfully comparing it with our former results in similar cases. This is largely a matter of personal equation coupled with the idiosyncrasies of patients treated. It is our firm belief that we are enabled to save every case of peritonitis that reaches us before the toxines have overcome all or nearly all of the vital forces of the patient. For instance, in our cases mentioned above, including

51 cases of perforative appendices,
9 cases of ruptured gall bladder,
3 cases of stomach and duodenal perforations,
1 case of typhoid perforation (ulcer),
2 cases of traumatic peritonitis from horse kick,

nineteen of these cases had terminated in diffuse, septic peritonitis; three of these died, as they were practically moribund, thoroughly cyanotic and the blood showing a marked leukopenia and all of the resisting forces surrendered to the infection, and while we record them it was in no sense a fair test of the remedy, as they were hopelessly overwhelmed with toxines and practically pulseless when they reached us. In the other five deaths which we had in the series of the 177 cases treated two were due to urinary suppression, from which they were suffering when they reached the hospital. One metastatic abscess of the liver proved incurable and died from cholangitis. One of the duodenal and one of the stomach ulcer cases died from pneumonia and shock, respectively. In the other fourteen cases of peritonitis the leukocytes ranged from 11150, which was the lowest, to 28400, which was the highest.

The following chart, selected from our series on account of the persistence of temperature for several days after the treatment, which is unusual, and because of the large quantities of iodine that was eliminated, is herewith presented. This tabulation will give a good idea of how the charts are kept, and, together with Prof. Holtzendorff's table of urinary findings of iodine, temperature, blood count, pulse, blood pressure, etc., are also shown, together with the results of cultures taken from the pus. It is obviously impossible, for want of space and time, to present the entire tabulated list of cases in our possession. Many of our cases, however, show only a trace of the iodine in the urine, a peculiarity for which we have no definite explanation at present. It is interesting to note that we have been unable to discover any irritating effects in the use of the drug upon the kidneys or any of the other organs.

The curing of peritonitis is not the only object of this treatment nor indeed the principal object. The prevention of the spread of an infection that is eminently threatening the peritoneum with invasion is one of the most beautiful and satisfactory assurances that we have to claim for it. In cases of recently ruptured gall bladders or recent perforations of the appendix where no time has been allowed for the walling off of the process, we have hitherto seen quite a few of these cases go on to peritonitis and to death in spite of a most gentle manipulation and careful drainage and treatment by Murphy's method.. The same can be said of gunshot wounds of the intestines or acute perforations of any of the hollow viscera.

With this sterilizing method we have yet to see a case of this latter kind above mentioned that was not immediately controlled and the infection terminated.

Report on Mose Fleming Case.

Residence, Trimble, Tenn. Referred by Dr. J. H. Smith, Trimble, Tenn.

Operation, Baptist Memorial Hospital.

White, age 12 years.

Family history negative. Was taken very ill with appendicitis four days prior to operation. Examination showed abdomen greatly distended, painful and glazed. Pulse 120 and thready, skin clammy and extremities cold, nausea and vomiting. Patient restless, eyes sunken, mouth and tongue red and dry and paresis of intestine, urine scanty and negative as to casts, but trace of albumen.

April 11, 1913, 9 a.m.—Blood count, 95 per cent poly.; blood pressure, sy., 130, m., dy., 60 m.; pulse, 120; temperature, 101; respiration, 24.

April 11, 1913—Operation.

April 11, 1913, 10:30 a.m.—Blood pressure, sy., 135 m.; pulse, 140; temperature, 101; respiration, 28.

April 11, 1913, 1:30 p.m.—Blood pressure, sy., 140 m., dy., 70 m.; temperature, 101 2-5; respiration, 24.

April 11, 1913, 6:30 p.m.—Blood count, 97 per cent poly.; blood pressure, sy., 140 m.; dy., 80 m.; pulse, 156; temperature, 102; respiration, 26.

April 12, 1913, 9 a. m.—Blood count, 95 per cent poly.; blood pressure, sy., 150 m., dy., 80 m.; pulse, 132; temperature, 101; respiration, 24.

April 12, 1913, 6:30 p.m.—Blood pressure, sy., 150 m., dy., 80 m.; pulse, 140; temperature, 102; respiration, 28.

April 13, 1913, 10:15 a.m.—Blood count, 95 per cent poly.; blood pressure, sy., 150 m., dy., 90 m.; pulse, 128; temperature, 102; respiration, 24.

April 14, 1913, 9:30 a. m.—Blood count, 89 per

cent poly.; blood pressure, sy., 150 m., dy., 90 m.; pulse, 138; temperature, 100 4-5; respiration, 32.

April 15, 1913, 9:30 a.m.—Blood count, 87 per cent poly.; blood pressure, sy., 150 m., dy., 100 m.; pulse, 120; temperature, 100; respiration, 24.

April 16, 1913, 7 a.m.—Blood count, 88 per cent poly.; pulse, 118; temperature, 99 4-5; respiration, 22.

Urinary Report of P. M. Holtzendorff.

Specimen A: April 11, 1913, 3 p.m.—Contains no iodine.

Specimen B: April 11, 1913, 6:30 p.m.—Contains no iodine.

Specimen C: April 12, 1913, 12:30 a.m.—Contains no iodine.

Specimen D: April 12, 1913, 6 a. m.—Contains trace of iodine.

Specimen E: April 12, 1913, 12 m.—Contains in 90 c.c. 0.0766 gram iodine.

Specimen F: April 12, 1913, 5 p. m.—Contains in 110 c.c. 0.1269 gram iodine.

Specimen G: April 13, 1913, 7 a.m.—Contains in 110 c.c. 2.5384 grams iodine.

Specimen H: April 14, 1913, 5 p.m.—Contains in 120 c.c. 0.3807 gram iodine.

Specimen I: April 15, 1913, 8 a.m.—Contains in 100 c.c. 0.0634 gram iodine.

Specimen J: April 17, 1913, 6 a.m.—Contains in 190 c.c. 0.2855 gram iodine.

Specimen K: April 19, 1913, 8 a.m.—Contains in 90 c.c. 0.0317 gram iodine.

Specimen L: April 22, 8 a.m.—Contains no iodine.

Cultures of Pus and Blood.

Streptococcus pyogenes and mucosus and the colon bacillus; the pyogenes streptococcus being the predominant organism.

Patient made complete recovery.

DISADVANTAGES.

The disadvantages in the use of this treatment are purely speculative, theoretical and imaginary. The principal adverse criticisms have been that such large quantities of iodine would be fatally toxic. Then it was suggested that the adhesions following the use of so powerful a drug to the delicate endothelial membrane would produce countless adhesions that would be more hostile to the patient's future welfare than the disease for which it was intended to cure. We can only give you what facts we have to controvert this.

To begin with, we have never seen the very slightest toxic effect nor any evidences of iodinism following this treatment, even when we used large quantities of the official tincture of iodine. We reduced the strength of the solution from 7 per cent official tincture to a 2½ per cent tincture, not because of its toxicity, but because we found, by slow graduations, that the 2½ per cent tincture was thoroughly efficient.

As to the adhesions our records show that we have reopened twenty-two abdomens in patients where the treatment had been previously used. The secondary operations were done for repairing resultant ventral hernias in eleven cases, for the removal of pus tubes in six cases, for gall bladder drainage in three cases and for small unilateral ovarian cysts in two cases.

In this series none of these cases showed any adhesions except a few cobweb adhesions around the hernial ring and in the hernial sac. The length of time that had elapsed between the second operations and the former operations in which the peritoneum was treated by our iodine method varied from nine months in the most recent to six years. This interim ought to have been sufficient to have given adhesions all the necessary time to form if they were going to do so.

Considering the almost inevitable adhesions that follow recovery from peritonitis, especially of the more virulent types, we are led to believe that the iodine treatment prevents, rather than encourages, this unfortunate sequela.

ELIMINATION.

We are often asked what becomes of the drug after it is poured into the free peritoneal cavity in large quantities. To this end we have had competent chemists make numerous laboratory tests of the secretions and excretory matters in order to determine what became of that part of the iodine that was not removed at the time of the operation or could not run out through the drainage tubes. The results have been, as shown by the above chart, that elimination takes place largely through the kidneys.

It is interesting to note that in none of these cases has the iodine appeared in the urine earlier than the eighteenth hour after its use, at which time only a trace is found. The elimination is at its height from the third day on to the seventh. Its combination with the salts of the blood in the form of iodides is very interesting from a physiological and therapeutic standpoint. In some cases as high as forty grains of iodides to 3½ ounces of urine have been found.

CONCLUSIONS.

We are all deeply indebted to Murphy for his praiseworthy and scientific treatment of peritonitis and we recognize the vast benefits derived from it, just as we recognize him as one of the world's greatest teachers of surgery. We are amazed, however, at the wonderful results recorded in his October issue of *Surgical Clinics*, wherein he states that he has had but three deaths from peritonitis since 1904. We believe that he is sincere and accurate in his statements and that falsification could not enter into the recording of his results. We are inclined to assume that his cases have been mild and early ones, although he says that this is not true. Surely his clientele are alert to the importance of early operations. At least we must assume that he has been signally blessed. To those of you who have had such brilliant results you need have nothing further to hope or wish for in the way of treatment. However, in our cases we have not been so fortunate. We have not alone lost cases of early peritonitis after the most careful drainage and gentle technique, following out Murphy's plan to the very letter, but we have seen some of our cases of gangrene of the appendix with perforation and gangrenous perforated gall bladders, that reached us before actual diffuse peritonitis had resulted, go on and die in spite of our most earnest efforts, prior to the inauguration of our iodine treatment. We believe that most of you have had similar experiences. There was a time when, if we opened an abdomen and found a leaking appendix into a free cavity, with fibrin plaques here and there on the adjacent intestines with turbid peritoneal fluid present, yet no successful walling off, we were filled with doubt and fear as to the outcome. Many of these cases, however, will get well by simply removing the source of infection, whether it be a ruptured gall bladder or appendix or a leak from any of the hollow viscera, because the outpouring of white cells and serum may still be defensive and surgery may cure the patient. On the other hand, these fluids may have already become virulently infected, in which case the outcome for recovery is only speculative. The iodine treatment here is eminently fitted and concludes the story of infection and eliminates the doubtful possibilities of recovery. It is well to mention that convalescence after this treatment is much more comfortable in any case of peritoneal infection, because the element of pain is eliminated, serious gaseous distention of the intestine is also practically overcome in a very few hours, and you have a patient that is free from pain, with little, if any, nausea and fever, with a flat abdomen and with an intestinal tube capable of performing its normal functions.

The mental worry and anxiety is eliminated in both patient and surgeon and a definite prognosis of recovery can be given.

Exchange Bldg.

DISCUSSION.

Dr. Frank, Louisville, Ky.—I have heard Dr. Crisler's and Johnson's paper with a great deal of pleasure and with very much interest.

The subject of iodine in connection with surgery, particularly abdominal surgery, is a subject in which I have interested myself since reading one of their early papers. I felt very doubtful, early in my work with iodine in connection with abdominal work, as to its value and as to what were the ultimate results in preparatory methods in comparison with those which we had been using. Being, however, of free mind, without prejudice, and believing that we should give every man's proposition an opportunity, I, with very great reluctance, began the preparation of my patients before operation with iodine; not that we thought this was necessary on account of any fault in healing or any dissatisfaction with results which we had obtained, but simply to prove out this proposition. We have found in our work that iodine, so far as skin preparation is con-

cerned, is a safe procedure, provided certain definite precautions are used. With those results in mind (and I trust you will pardon me for citing some facts which led up to my ultimate conclusions with regard to iodine) and with such facts in mind (which I will cite in a moment) we proceeded to try, as some writer has said, "the remedy on the dog." We have concluded a certain number of experiments. I believe that they entitle us, just as much as they entitle Dr. Crisler, to speak with some authority upon the effect of iodine **within** the abdominal cavity. Our experiments are still going on. We have found in the normal dog that the injection of more than 1.25 c.c.m. tr. iodine to the kilogram of dog's weight (notwithstanding Dr. Johnston's report) invariably resulted in the death of the animal from shock. I make that statement advisedly and as a result of examinations by competent pathologists following injections.

We have found that the injection of an equal amount of absolute alcohol in the abdominal cavity of the apparently normal dog—the normal cavity—results most always in death; in a few instances in recovery, and always in extensive peritoneal adhesion. We have found that the depositing of an equal quantity of pure iodine crystals within the normal peritoneal cavity of the dog; that is, an equal quantity as obtains in the 1.25 c.c.m. per kilo, has always resulted in extensive adhesions about the point of injection. We have found that the injection of normal saline in the dog's abdomen in this quantity and in larger quantities did not result in this. We have found that the injection of Lugol's solution had a lethal effect, except it was possibly more rapid. I cite you instances. I do not wish to express my conclusions, but simply state these facts that you may draw your own conclusions. It has been a fact long known that pure iodine may be used intra-peritoneally in some instances, and I believe it was a practice in Joe Price's clinic to sprinkle iodine in the tuberculosis peritoneal cavity. We have found in the infected peritoneum that iodine, when it came in contact with normal peritoneum, produced disastrous results.

One more point: Our experience (and I mention this because the essayist has questioned the results of Dr. Murphy's experience) with diffuse peritonitis of appendiceal or any other origin—and I think the question of diffuse peritonitis and perforative peritonitis susceptible to many constructions—has been such that we can certainly endorse and absolutely verify and sustain the statements of Dr. Murphy and in this work we have seen no necessity to use either tincture of iodine, as it has been advised to be used, nor bichloride of mercury, as was formerly used.

We all know the conditions that exist in the pelvic conditions mentioned with pus, usually sterile, and I am astonished that any one would put an antiseptic into the belly for the treatment of those cases. It is the custom today among most surgeons to close this class of cases without drainage.

Dr. Duncan Eve, Sr., Nashville, Tenn.—I wish to state that Dr. Crisler presented a most excellent paper last year at the Jacksonville meeting, and being enthused with the idea of the use of iodine by Dr. Crisler in the abdominal cavity, I thought it might be applicable and perhaps the only agent that might avert an amputation of the limb because of a serious infection of a case of compound fracture of the patella of eight weeks' standing. The case was brought to us from an adjoining county, in which the infection was so great that there were sinus openings both above and below the knee. The infection was so great that I thought of making an amputation, but decided first to try iodine. After opening up the joint and sinuses and pouring in the iodine over the infected tissues, I used 50 per cent tincture iodine, and I desire to state that the patient after awhile was relieved, and that not only his life, but this limb was saved by the iodine.

Dr. Stuart McGuire, Richmond, Va.—I can best express the way I feel about the use of iodine in the abdomen by saying if my sister was on the operaing table and a surgeon was about to pour tincture of iodine into her abdomen, and there was no other way to stop him except to shoot him, then I would shoot him. I believe the methods advocated by Dr. Crisler are contrary to general surgical principles, and are a reversion of practice to a period of thirty or more years ago, when surgeons irrigated the abdominal cavity with solutions of bichloride of mercury.

Dr. Crisler is a man of unquestioned standing in the profession, and we are all forced to accept his statements. He tells us he has used iodine in over 1,000 cases of local and general peritonitis, and his results are most remarkable. It is difficult and embarrassing to oppose the views he advances, when he speaks from facts, and I only speak from theory. There is such a thing, however, as "surgical instinct," and my instinct tells me that the practice advocated by Dr. Crisler is wrong; and there is also such a thing as "surgical conscience," and my conscience makes me feel it necessary to warn the members of this association against employing this method until it has been most thoroughly tested, and the results, reported by Dr. Crisler, corroborated by other observers.

I think Dr. Crisler has made a mistake in reading his paper before the Surgical Section of the Southern Medical Association. We are busy, practical surgeons. Few, or none, of us are research men or trained investigators. Theories as new and practices as radical as those advocated by Dr. Crisler should be submitted to laboratory men working in large institutions, or to research men connected with metropolitan hospitals, who could make preliminary experiments on dogs and lower animals before trying the method on human beings.

Dr. Joseph Graham, Durham, N. C.—I do not arise, sir, in a spirit of criticism. I do feel like criticising the Tennessee people about the way in which they have cared for their gall bladders, in that Dr. Crisler has had nine cases of ruptured gall bladder in a short period. We younger men look with respect and admiration upon the work of the men who have preceded us. It is through them that we get our encouragement, our inspiration; but, sir, I think it is a mistake for older surgeons to read papers that bring forth as revolutionary a change in the practice of surgery as Dr. Crisler advocates. We have had too many changes in surgical practices. I think with

the large experience that Dr. Crisler has had in the use of iodine that he could have referred the matter to some commission and had it tried out experimentally and in the practice of others. I heard at Jacksonville last year, with surprise, Dr. Crisler's paper. It did not appear to me to be a safe procedure. It reminded me of the old abortive treatment of urethritis. I have not applied the remedy.

Dr. G. H. Wood, Batesville, Miss.—I would like to ask a question. How long continued, I would ask Dr. Crisler, those cases of perforated bowel were before he operated upon them? I had a similar case and I would just like to know.

In regard to the other point that has been raised, it seems to me there is quite a difference in putting tincture of iodine in the percentage he gives us into a healthy peritoneal cavity, under pressure. He puts it into a diseased peritoneal cavity and a drainage tube put in for a few days

Another thing I object to that the doctor brings out: that no revolutionary measures should be brought before this association. If a man learns of a revolutionary measure that is successful, he ought to bring it forward, and I, for one, knowing Dr. Crisler's ability, think we should rely on whatever he tells us.

Dr. H. P. Linsz, Wheeling, W. Va.—Iodine in the abdominal cavity has a very warm place with me in certain cases.

I will relate one case I have in mind in which it was used with beneficial results. A Miss W. was brought to me suffering from a tubercular peritonitis. She also had empyema on the left side, which on evacuation revealed about two quarts of pus. I opened the abdomen about two weeks later and released some twelve quarts of muddy fluid. On inspection I found the bowels, ovaries, tubes, uterus and omentum, as well as the entire peritoneum thickly covered with tubercles. I removed the right ovary and tube and the appendix, these being otherwise diseased. I decided to use iodine in this case, and poured a quantity, some three drams of the tincture, into the abdominal cavity and sprinkled about one-half dram of iodoform over the intestines, inserted long iodoform gauze drains, and closed the abdominal wound.

Patient improved, but some nine months after this treatment the abdomen again became distended. I reopened, repeated the treatment after observing the tuberculous condition had almost disappeared, and the patient recovered entirely, except for a slight hernia which had developed in the lower angle of the wound, which was later repaired.

Before operation the patient weighed eighty-five (85) pounds. This was four years ago. She was married about a year ago, now weighs one hundred and forty-five pounds (145) and is in the best of health.

Of course, I agree with the doctor, that in some cases this treatment will not do.

Dr. John L. Jelks, Memphis, Tenn.—I think I voice the sentiment of this association when I state it is a man's duty to present any new work to this society. (Applause.) When I made a statement twelve years ago that I was injecting formaldyhide into joints and tissues inflamed, and when I made other statements concerning formaldyhide in surgery, some of my own local men said: "More conservatism, later study, more careful observation, and we believe Dr. Jelks will retract his statement." But I have none to retract.

I have put iodine into the belly, but not as Dr. Crisler has. I have put formaldyhide into the belly. Twelve years ago I did it. I do not hesitate to do it today.

You are not going to put iodine and alcohol into a healthy peritoneum. You set up entirely a different process when you put a drug into an inflamed and infected area; but I believe Dr. Crisler is getting a great deal of his results from alcohol the abdominal cavity. I do not believe that Dr. Crisler ever did or ever will stop the progress of a streptococcic process in a peritoneal cavity when we know the streptococcus will grow at the rate of one-third inch an hour; but I would say that alcohol and iodine are permissible by men who have known and learned how to use it, and I feel sure that this man has done this thing before advocating its use.

Dr. Jere L. Crook, Jackson, Tenn.—In passing judgment on papers presented at meetings like this, I think two factors should govern: First, the credibility of the witness; then, the next test, as to whether we should use a remedy, is to be met at the bar of mortuary statistics. I believe (and I think it is upheld by every one here) that we cannot question for a moment the credibility of the witness; the second thing is, does the method advocated stand the test of mortuary statistics? The length of time in which this treatment has been used is something like seven years and a half as stated by the essayist and his conclusions are based upon the work of Dr. Johnson, Dr. Crisler's partner, and himself, and is the conscientious presentation of the work and results of both these able and honorable men. Therefore, I do not think there is justification for the criticism of the essayist made here today; also I heartily disagree with the idea that we have to submit anything we wish to present to any board of censors. Now, it is our duty and right to state our differences with Dr. Crisler, if we do not agree with what he said, but let us not, by our criticism, impeach his veracity, nor condemn him for presenting his experience to us.

One point made by Dr. Wood: Dr. Crisler did not urge—at least I did not understand him to say—that iodine should ever be used in the case of an uninfected peritoneum. Every time he used iodine he had an infected condition, and he was using his iodine to lessen the infection and the ability of the peritoneal membranes to absorb any more poison.

This whole question of iodine is a new thing. The first man who used iodine in open wounds was considered radical, yet we are all doing it now and getting fine results. You take a railroad injury with a wound full of grease and bacteria. We do not even wash the skin; we simply fill the wound with iodine and it gets well, often healing by first intention. Dr. Crisler's cases do not die. His results speak for themselves and answer the most caustic criticism. He has proven that he did not have adhesions in twenty-two cases, where secondary operations were performed. I have

watched Dr. Crisler's work and that of Dr. Johnson, and while I must say I am waiting for it to go further, yet I certainly do not think those of us who have had no experience with iodine in septic abdominal conditions should condemn the work of men whose experience is so brilliant and so gratifying.

Dr. George R. Livermore, Memphis, Tenn.—I simply rise to state that we all know that every new thing that comes out is always opposed by some people. We do not doubt Dr. Crisler's new discovery and do not doubt what he says.

Those who have used iodine have nothing but good to say about it, and those who have not used it have no right to condemn it. We all know that an ounce of facts is worth a pound of theory, and until we have used iodine and know what it can do we have no right to criticise Dr. Crisler.

We are proud of Drs. Crisler and Johnson and want them to have the credit that is due them.

Dr. Herbert Acuff, Knoxville, Tenn.—I certainly want to congratulate Dr. Crisler upon his spirit of adventure in his use of iodine in the abdomen. Recalling that every great achievement of surgical science has met with heated opposition at first, I think we should be more considerate of his efforts, less anxious to condemn, and less severe in our ridicule of the statements and claims set forth in his paper.

My experience with iodine in the abdomen has been limited, but of the few pus cases in which equal parts of iodine and alcohol have been used, our results have been very gratifying indeed. I have seen the temperature subside within a few hours, the septic chill abate, the cardiac embarrassment relieved and the profound toxemia clear up after the free use of the iodine sponge, and wherever accessible the continuous irrigations with one per cent iodine solution following.

In the management of the annoying stitch abscess, the mopping out with iodine and the through and through irrigation with iodine solution has been very satisfactory to me.

Again I want to congratulate the essayist upon the fearless intrepidity with which he has approached this subject and register myself as an anxious seeker after whatever good his future investigations may demonstrate.

Dr. Crisler closes—Mr. Chairman, I thank the gentlemen very kindly for their criticism, both pros and cons.

Fortunately we live in a democratic country, in a free country, and we are not going to grab up these gentlemen and make them use iodine and we are not going to use it in their abdomen—certainly not without their consent. The more severe the criticism the better I like it. I know these two gentlemen and know they are perfectly sincere and honest. They mean perfectly well. They face a situation with which they are not familiar. I believe Bulwer said: "It is only the coward who will boast of his bravery in situations with which he is not familiar." Only those doubt this treatment who have not had the slightest experience with it.

I don't know how Dr. Frank used his iodine on his dogs; whether he infected the dogs in the beginning, and caused steptococcic peritonitis, then tried to cure them. It is immaterial to me, because our treatment has been evolved step by step. At first we were at a loss to know what to do with certain types of appendices. We cut a hole in there and find an old, gangrenous appendix with a pocket of pus. We were taught to drain those, and of course they get well, nearly all of them; but we like the idea of pouring that pocket full of iodine and getting that appendix out of there. It doesn't hurt anything to do that. You can go a step further than that, and then a step further, and feel encouraged all the time.

It is not material to me what these gentlemen think about it, and I think, perhaps, if I knew as little about it as they do, I should probably be just as rabid. We have given this thing out squarely and clearly.

Dr. Graham doubts our technique in gall bladder surgery and insinutes that we handle our cases badly. If it were not bad taste, I would just like to tell him something of our results in such cases, but this would be another matter and not pertinent to the essay. The case mentioned was referred to us by your President here, Dr. Frank A. Jones, who can bear us out in what we have said.

In the section of the country where we live, the laity are not educated as they should be to early operations. Delayed and desperate pus cases comprise a very large per cent of our surgery. The doctors throughout our territory are alive to the importance of early surgery, but they cannot educate the people to the importance of it except by slow degrees. We are seeing more and more pus cases, perhaps due to the fact that we are able to cure a larger number than we were previous to the time we adopted our iodine treatment.

If I understood Dr. Frank correctly, he closes his wounds without drainage in these filthy, reeking, dirty appendiceal cases. I hope his results justify him in doing this, but our cases treated in such manner would die. It has long been the rule to drain an appendiceal abscess for instance, without disturbing the pathology. We pour this abscess cavity full of the iodine solution and then remove the pathology in perfect safety, in an immersed field. Please remember that we invariably drain in every case wherein we use the iodine treatment. The increased peritoneal effusion would demand this, if for no other reason.

OBSERVATIONS ON PREPARATION AND ADMINISTRATION OF AUTOGENOUS VACCINES.*

By Henry Hanson, M.D.,
Senior Bacteriologist, State Board of Health of Florida,
Jacksonville, Fla.

My experience in preparation and administration of vaccines has been entirely with the

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*Read in the Section on Surgery of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

autogenous variety. In this line of work one soon finds that all cases do not respond alike, even though the vaccines prepared are for similar conditions and for individuals of apparently the same degree of health. All infections are not adaptable to vaccine therapy, and it becomes necessary for the person who has the preparation of the vaccine in hand to examine the case closely and determine whether or not it is one which will receive benefit from such treatment. For instance, certain skin affections seem quite amenable while others apparently derive no benefit whatsoever. It is a difficult matter, however, simply from the inspection or physical examination to determine which cases will respond to vaccine therapy. One often finds a case of acne which, when first seen, does not seem to be suited for such therapy, but which is found, after a few administrations of a properly prepared vaccine, to give results that are most satisfactory. On the other hand, there are cases which seem very favorable for such line of treatment where the results are absolutely negative. These variations are hard to explain. Sometimes it is due to the manner of preparation of the vaccine, and in other cases it is due to the pathological condition of the area involved.

We know from the work which has been done along this line of immunity and antibody formation that cases are sometimes encountered where it seems extremely difficult and almost impossible to overcome the infection. In certain instances this is due to an infection with a highly virulent strain of organism where the multiplication of the organisms in the tissues is so rapid and the injurious elements produced by their presence in the tissues are so great that the response of the individual is insufficient to overcome them. This, of course, refers to the more serious and fatal cases of septicemia. Again there are other instances where the activity of the organism has been checked to a large extent and where the condition remains in a semi-quiescent state. In such conditions the lesions neither grow worse nor do they grow better. The most pronounced instances of this type are found in certain cases of acne. The system in attempting to overcome these organisms has created sufficient immunity to prevent these organisms from extending beyond a certain point, but has failed in its effort to overcome and destroy the said organisms. The bacteria in these instances, according to Erlich's theory, have become immune and have reached that state which he designates as fast when they can neither be destroyed nor can they increase beyond a certain point. In certain of these cases, where one is led to believe upon inspection that immediate and marvelous results will be obtained by means of vaccine therapy, one finds that the results are absolutely negative. Other cases, on the contrary, which seemingly belong in this class, are such as only need the added stimulus which a vaccine furnishes to go on to a very marked and rapid improvement.

Another point which is of great importance in this line of work is the dosage and the time interval between said doses. It is to be regretted that we are not following Sir Almoth Wright's original plan of determining the opsonic index, which is the only accurate method of calculating the doses for each individual case. The original technique for determining the opsonic index was rather difficult, and more intricate than the ordinary practitioner, or even the ordinary bacteriologist, could carry out. Certain modifications have been introduced recently, however, by means of which any expert bacteriologist can, with care, determine the dose for cases which require bacterial therapy. However, it is not always necessary to go through with this procedure since we have learned by experience that we can depend upon certain reactions and certain time intervals as a guide in the amount and frequency of the doses. These reactions and time intervals, however, should be very closely observed if one wishes to secure the proper

results. Wright, in his work along this line, found the reactions passed through certain phases; for instance, he found that in the first period after the inoculation of from twelve to twenty-four hours the opsonic index fell below its previous level, which he called the negative phase. Then after two or three days there was a rise of opsonic power, which he called the positive phase. It would be a very serious mistake in vaccine administration to do as I have often seen done—administer a dose at the end of the first part of the negative phase and follow up with a second dose before the negative phase would have reached its lowest level. In such instances the administration of the vaccine does a great deal more harm than good, and the patient is to be congratulated upon his resisting powers and the ruggedness of his physique if he does not sustain permanent injury from such indiscriminate use of an otherwise valuable therapeutic agent. In these cases it is no wonder that you are told by the physician for whom you prepared the vaccine that the patient is no better and is showing no beneficial results from the vaccine. On the other hand, if the doses are properly spaced and given not more frequently than from four to six days, one will find that the results will eventually show that positive phase which Wright has spoken of as the "sustained high tide of immunity."

As important as all of the foregoing is the matter of being absolutely certain that you have the organism which is the cause of the disease. In order to proceed with your vaccine with any degree of satisfaction it is necessary that you should personally see your patient and select the lesion from which to take the culture. If this is not done and the culture is taken by some one whose bacteriological technique is not perfect, a mixed growth may be obtained. In these instances you may be led to believe that there is a mixed infection where there is really only one single infection which is responsible for the cause of the disease. Vaccine from the single organism which is the true cause of the disease would give the desired result. A vaccine prepared from the mixed growth might give the desired result, but might be said to be similar to "an effort to hit a limited target with a rifle and a shot gun"; the charge from the shot gun, if at close range, would hit the target but leave some disfiguring results. The same principle holds true for the use of the stock mixed vaccines.

I was formerly of the opinion that the secondary invaders were to a large extent responsible for the clinical symptoms. It is very probably true in certain cases of pulmonary tuberculosis with the pronounced exacerbations of fever in the afternoon that the streptococcus plays a very important role, and that if one prepared an autogenous vaccine in such cases from cultures of streptococci obtained from the sputum after the sputum had been carefully examined and washed in a sterile salt solution one might be able to do a great deal of good. I do not believe, however, that all the organisms found in the so-called mixed infections play a very important role in the course of the disease.

Briefly stated, the person preparing the vaccine should see the patient and take the culture. In taking the culture the lesion should be carefully cleaned with 95% alcohol, and for the ordinary pyogenic organisms cultures could be grown on the plain nutrient agar. For organisms where a special media is required one will, of course, have to select a media which is especially adapted to that particular organism.

Twenty-four-hour cultures in my hands have given the best results for vaccines. One occasionally hears the statement that better results are obtained if one uses cultures of different ages; for instance, a mixture of the twenty-four-hour growth with the growths of thirty-six to forty-eight or more hours, even up to four and five days. On this point I can only say that from the limited trials which I have made with such cultures I have not ob-

tained as nice results as I have where I closely followed the use of the twenty-four-hour culture. As a rule in the sterilization of these cultures they should not be heated over sixty degrees centigrade, and in certain instances they are better not heated over fifty-six degrees centigrade. The results, however, are not always dependent on this degree of heat. I remember two specific instances where the cultures were heated considerably beyond that point, one of them up to eighty degrees for twenty minutes, and another occasion where a culture for a case of impetiginous acne was boiled for a few minutes, not intentionally but accidentally. In the case where the culture was boiled I intended to make up a new stock, but did not have time to do so before the patient came for the administration of the vaccine, and, more for the experiment than with any hope of obtaining results, I proceeded with the administration of the vaccine as I had in cases where the proper heating procedure was followed. This patient after five injections at six-day intervals cleared up entirely, and has remained well for two years without any sign of recurrence of his skin trouble. On the other hand, I have had cases since then where by accident the vaccine was overheated and where the results have been unsatisfactory. The majority of cases which have shown good results have been those where the vaccine was made according to the strictest rules.

In the dermatological affections where I have obtained the staphylococcus albus or aureus culture my initial dose for adults has been two hundred and fifty million dead organisms followed in from four to six days with a second dose of the same size where the reaction was at all pronounced. In those cases where the reaction was not so pronounced I would give five hundred million dead staphylococci, which in most cases has been considered the maximum dose.

In making up a stock solution of vaccine I do not consider it advisable to put the entire stock in one bottle, but use a one cc. ampule, similar to the one which Major Russell uses for his anti-typhoid vaccine, and put up the entire stock in individual doses. In this way there is no chance for contamination and it also serves to guard against improper doses of the vaccine. My preference of a syringe is the all glass syringe of the Leur type. In these syringes there are no leather or rubber washers to get out of order. It is important always to observe strict asepsis.

In conclusion I wish to emphasize the importance of making sure that you have a sterile vaccine before proceding with the administration. The ordinary methods of plating small quantities of the stock are, in most cases, sufficient to determine this, but it may happen that one has a contamination with tetanus. Bassett has recently called my attention to a very simple method of testing for the presence of tetanus bacilli which consists in inoculating sugar media in a fermentation tube with a small quantity of the vaccine suspension. If one combines this method with the plate method and obtains a sterile agar plate, but formation of a diffuse turbidity in the closed arm of the fermentation tube, it indicates the presence of the tetanus bacillus. Such stocks must be discarded and a new preparation made. If the media in the closed arm remains clear tetanus bacilli are not present.

A further point which is worthy of consideration is the site of inoculation. Usually with the prophylactic vaccines, either of dead or living virus, one will choose a single area. Where the living virus is used this procedure is sufficient, because the living virus does not tend to localize itself in the same degree that the killed virus does. In order to overcome this tendency to a localized reaction in the case of the killed virus various procedures have been recommended, such as massage and warm applications with the idea of increasing the circulation at the site of inoculation. This should be done in obstinate cases and cases where the lesions are scattered over a wide

area, such as a furunculosis of long standing and acne. I have noticed that the areas in the immediate neighborhood of the inoculation have shown the most pronounced improvement, and believe that if one would vary the inoculation site according to the area showing the most involvement the best results would be obtained.

DISCUSSION.

Dr. John L. Jelks Memphis Tenn.—One point I would like to call your attention to that has not been mentioned: The source of the supply of the infecting organisms, as, for example, in the use of bacterins in colon bacilluria, or the use of bacterins for the treatment of infections of the colon. In both of those cases, probably, the infection (I say probably) is from the same source—the colon. Therefore, I would suggest that it is quite as important to acquaint yourself with the fountain or source of the trouble as to immunize the patient against those toxines already observed.

As to autogenous bacterins in the pruritus ani, which are certainly of far more value than stock vaccines, while it might be better, in some cases, to use a stock vaccine, yet surely the pruritus ani autogenous bacterins are of the greatest value. By cleansing the surface thoroughly, an opportunity is afforded to obtain the infecting organisms, the streptococci and staphylococci, in their relative members, and we get better results when we use autogenous vaccines, **but in most of those cases we have a small sinus or some infecting source that we must rid our patient of, else, though you give him temporary relief, he will have a recurrence of the skin infection and symptoms.**

Dr. John Funke, Atlanta, Ga.—With regard to the length of time: I want to say twenty-four hours does not seem quite long enough to me. The staphylococcus produces an endocellular toxin and this substance must have time to develop, and consequently I let my cultures go at least forty-eight hours, giving the endocellular toxin time to develop.

I have never had much experience in treating pyorrhoea alveolaris with vaccines. It is a difficult matter to handle all kinds of spirilli which are found in the mouth and of which we know little. In some instances the responsible organism will not grow. I have treated some cases of the pyorrhoea alveolaris with vaccines, but they were rather unsatisfactory.

In some instances you can make up the vaccine without separating each organism and growing them in pure culture; often that is not possible, for in some instances the responsible bacterium is overwhelmed with a contaminant organism. Under these circumstances, one must grow pure cultures.

I want to say before I close, that in treating these suppurating processes—I am speaking of old infections—one must bear in mind there might be some foreign body in the area. So long as that foreign body is present you won't get any results. You must remove that foreign body before you can hope to get good results.

Dr. E. D. Holland, Hot Springs, Ark.—In the first place, you always have several different microorganisms from which to make a culture. The only way to get an autogenous vaccine is to make a culture from the infection, after having obtained by actual count the numerical relations of the different bacteria to each other, and the vaccine must contain the different bacteria in the right proportions or it is not an actual autogenous vaccine.

For instance, you have an infected knee joint; you tap this joint and make a culture from which to obtain your autogenous vaccine. You may find that this joint contains staphylococci, streptococci and gonococci, etc., but the numerical relation these different organisms will bear in the culture from which the vaccine is made will be entirely different from their relation to each other in the infection.

Consequently autogenous vaccines do not always give the results that they should.

Dr. Hanson, Jacksonville, Fla.—The points which I wish to mention that have been brought up in this discussion are that in any case of streptococcus infection it is important that one should make up his own autogenous vaccine, since the antibodies for the different strains of streptococci are not interchangeable in their action. That is, the antibodies produced by one strain of streptococci will not produce immunity against a different strain of streptococci. You may administer a vaccine from one strain of streptococci without any effect whatever upon the infection which is due to one of the other strains. On the other hand, in cases of staphylococcus infection it has been found that the antibodies for the staphylococcus albus or aureus produces antibodies which are specific in their action for other strains of pyogenic staphylococcus.

In regard to mixed growths from dirty surfaces, or from lesions where there is an opportunity for contamination, I am of the opinion that such mixed growths do not represent the true condition of affairs. One usually finds that the number of different organisms obtained from a lesion is limited if proper care is observed in cleaning the surface before taking the culture. One usually finds that in a given lesion there is only one type of organism which is the cause of the condition. The organisms in the cases of cystitis and pruritus ani which are responsible for the condition are somewhat limited. In pruritus the streptococcus has been found to be responsible in most cases.

In bacillus or germ carriers it has been found that most of these carriers are immune to their own organisms and one cannot hope to gain any very marked results from vaccine, either stock or autogenous, in such cases. This especially refers to those cases which are considered purely mechanical carriers without any manifestations of the disease. In cases of pyorrhoea alveolaris and pruritus ani it is not necessary to have a mixed vaccine because both of these conditions are due to the streptococcic infection. In securing cultures from cases of pyrrhoea it is important that the patient should rinse his mouth thoroughly with sterile water or some mild antiseptic before the culture is taken. The culture should be taken with a platinum loop which is inserted for about two millimeters between the gum and root of the

tooth. Pressure exerted on the gum just below the root of the tooth will usually force the pus out of the pus pockets sufficiently to enable one to secure a satisfactory culture.

The streptococcus which one obtains in such cases is usually a very slow growing organism and one does not secure sufficient material in twenty-four hours' growth from such cases. I have been obliged to grow a culture for forty-eight hours from these cases in order to secure enough material. When one secures a heavy mixed growth from these cases I believe that all the other organisms can be discarded and the streptococcus alone used for the vaccine. There is a very complete report of the use of autogenous vaccines in cases of pyorrhoea alveolaris in the American Journal of Medical Science, by Lane. He reports 100 cases. In suppurating wounds and chronic furunculosis and also in chronic tuberculous conditions, one should use autogenous vaccines, if vaccines are used at all.

The far-reaching effect of autogenous vaccine in properly selected cases is hard to estimate at the present time. One should not make the mistake of assuming that vaccine therapy will replace other forms of therapy. While vaccine therapy is very useful, it has a rather limited field.

BOOK REVIEWS.

Joe, the Book Farmer. Making Good on the Land.

By Garrard Harris. Illustrated. Harper & Bros., publishers. New York and London. 1913. Price, $1.

It is not customary for this Journal to review books of unprofessional literature, but in this instance the book in question is so excellent in construction and will undoubtedly have such a beneficial influence upon the audience for which it was intended, that the impulse to speak a few words of commendation is simply irresistible. It tells the story of a lad 14 years of age, just such a boy as has undertaken just such an experience during the last year or two, and with just such triumphant results. With the assistance of a philanthropic old merchant he took four acres of the poorest land to be found on his father's farm, land "too poor to sprout peas," and following strictly the instructions published by the government experts, made and gathered from those four acres in one year products amounting to $660! The book proceeds to tell exactly how he secured this wonderful result, and tells it so plainly that it would be easy for any intelligent reader, under similar circumstances, to do likewise.

The book is written with an absolute absence of technicalities. The result will be that hundreds of boys in the Southern States will be aroused to a new ambition to "make something out of the old place," and though the good fortune of Joe may not be equaled, yet a great improvement will ensue, and perhaps, like Joe's father, their paternal ancestors may also be tempted to climb out of the ruts and become farmers in fact as well as in name.

To break the monotony of the story, the author has introduced a summer picnic, a 'possum hunt and 'possum supper, a bear hunt, and a deer hunt, so faithfully depicted and so beautifully expressed that they are worthy of a place in permanent literature. The country doctor who encourages his patrons to add this book to their winter's reading will be slyly insuring payment for his own professional services. It should also be read by every man who is interested in the development of the farm lands in the South.

Materia Medica, Pharmacology, Therapeutics and Prescription Wriitng.

For Students and Practitioners.

By Walter A. Bastedo, Ph.G., M.D., Associate in Pharmacology and Therapeutics at Columbia University. Octavo of 602 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1913. Cloth, $3.50 net.

As stated in the introduction, this book is an adaptation from the author's lectures at Columbia University, stressing especially those points that will be found helpful to the physician in his practice. It likewise emphasizes the experimental and laboratory investigations of interest primarily to the pharmacologist. It is divided into three parts, the first of which contains the introduction, pharmaceutical preparations, methods of administering drugs and other fundamental principles of materia medica and pharmacology. The second part is decoted to the individual remedies under a convenient and customary classification of therapeutic action. Each drug is described under its source, prepartions, pharmacologic action, toxicology and therapeutic use, in each instance recognizing the recent facts gleaned from experimentation. Many of these drugs have received thorough revision in the presentation of the subject-matter. The third part is devoted to the principles of prescription writing, with many valuable and useful suggestions. Altogether, it represents one of the most complete and modern works now available on this important matter of drugs and their use.

Hygiene and Sanitation. A Text-Book for Nurses.

By George M. Price, M.D. Lea & Febiger, Philadelphia. 1913.

A book devoted to hygiene and sanitation from the nurse's standpoint meets a distinct demand. This work describes the elements of hygiene, the hygiene of habitation, foods and food supply, schools and school children, occupation, municipalities and personal hygiene. An excellent manual that will be very serviceable in promoting health and happiness.

The Southern Medical Journal

Journal of the Southern Medical Association

Incorporating the Gulf States Journal of Medicine and Surgery and Mobile Medical and Surgical Journal.

Published monthly at Nashville and Mobile. Price, $3.00 per year; 25 cents per single number.
Address Southern Medical Journal, Suite 905 Van Antwerp Bldg., Mobile, Ala., U. S. A.
Entered as Second Class Matter July 8, 1908, at the Postoffice, Nashville, Tenn.

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Next Meeting, Richmond, Virginia, November, 1914.

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THE MIDWINTER NUMBER.

Attention is invited to this, the midwinter number of the JOURNAL. It will be found especially valuable on account of the Symposium on Tuberculosis and the Symposium on Cerebro-Spinal Meningitis. The articles in these symposia are written by the foremost physicians in the South in their mastery of the present knowledge of these diseases, and the discussions were conducted by men equally prominent in Southern medicine. But though the articles above referred to are of great value and importance, so likewise are the other contributions, and, taken as a whole, this number is one of which the editors are proud. Moreover the larger type and the increased number of pages over those given in 1913 are worthy of repeated mention.

Show this number to your fellow physicians, doctor, and speak a good word for your JOURNAL.

THE CANCER PROBLEM.

The recent meeting of the Southern Medical Association, at Lexington, enjoyed the reading of many medical essays of uncommon value. Among them two of the papers were especially noteworthy, not only from the eminent standing of their authors and the professional knowledge and literary skill displayed, but also because their theme was one which has for several years commanded the attention and interest of both the medical profession and the laity.

One was the public address delivered by Dr. W. A. Bryan, of Nashville, Professor of Surgery and Clinical Surgery in Vanderbilt University; the other, also an address before a public session, by Dr. Joseph C. Bloodgood, of Johns Hopkins University, at Baltimore. The title of Dr. Bryan's paper was, "The Cancer Problem;" that of Dr. Bloodgood, "The Cancer Problem from the Standpoint of the Laity,

the General Practitioner, and the Expert Surgeon."

It goes without saying that the papers of these two eminent gentlemen covered completely the ground indicated by their titles. It should be understood that they spoke to audiences composed of both professional and lay hearers, including many ladies, so that these important messages were delivered where they would be most effectual.

Space does not permit even a synopsis of these valuable papers. That of Dr. Bryan appears in full in the December number of this JOURNAL, and that of Dr. Bloodgood in the January number, but a few words illustrating their most telling points are in order. Dr. Bryan promptly riveted the attention of his hearers by telling them that, in all probability, out of every ten of them one would die of cancer during the coming year. He told them that early cancer was not painful; that too often when it became painful it was then too late to save life; that drugs and X-rays and radium were worse than useless except in a few cases of superficial cancer; that early excision was the only sure cure; that leaving operation for a "last resort" means waiting for a hopeless condition, and that all advertising doctors were fakirs. Also, he urged them when seeking a diagnosis to go to a man who knows, and not to the doctor who happens to be the most conspicuous church member.

Dr. Bloodgood's paper, as stated, is published in the January number of the JOURNAL. His audience was like that of Dr. Bryan, and in both instances the utmost interest was manifested. He devoted himself more to specific details, beginning with the statement that the number of deaths from cancer in this country is over 75,000 annually. He had been devoting his efforts to the study and analysis of over 5,000 cancer cases in the Surgical Pathological Laboratory of the Johns Hopkins Hospital, and some 4,000 other cases collected by surgeons and pathologists all over the country. He finds results today better than they were formerly, and attributes the improvement to better surgery. Like Dr. Bryan, he urges early operations as the only hope. He showed how cancer of the tongue or lip, if excised or cured during the first two months after the appearance of the lesion, would almost invariably be obviated, but if left over three months would prove fatal in a majority of cases in spite of surgical interference. He said that when a woman allowed a lump to remain in her breast until the skin adhered to it or the nipple retracted, over 30 per cent of her chances to live had vanished.

Dr. Bloodgood is an expert maker of pregnant phrases that brand their meaning indelibly on the memory, such as: "The easier the diagnosis the worse the prognosis." "Unfortunately, pain is not a symptom of onset in cancer."

He unconditionally condemns incomplete operations for diagnostic purposes as any delay after such surgical disturbances favors general distribution of the malignant cells. Such lectures to such audiences avert suffering and save lives.

RADIUM.

Radium is an element of comparatively recent discovery. It is now found in "carnotite," a substance mined in pockets. It is found in Colorado and Utah, and ore containing one per cent of carnotite sells in Hamburg at $95 a ton. The U. S. Bureau of Mines is said to have discovered a process of extracting radium that costs only a fraction of the Curie method.

So much is being said in the medical and lay press about the wonderful cures of well developed cancer by radium that some are wondering whether this latest therapeutic excitement is not destined to meet the extinction that has overwhelmed so many of the apparently great advances in medicine in recent years.

All of us remember the sudden rise and fall of "goat serum," of tuberculin, of antiven-

nine, of Friedmann's serum, and many others, some of them having a modicum of real usefulness which was, for a time, destroyed by over-exalted claims.

No one doubts that radium, as used by Kelly, has caused the disappearance, for a time, of epitheliomas, or perhaps of even more malignant forms of cancer growth, where the radium could be placed almost in direct contact with the diseased tissue, but conservative surgeons long since fixed a period of from three to five years in which the patient must remain free from either recurrence or metastasis, before a cancer can be positively declared cured. Has any new development warranted a departure from that conservative opinion? Moreover, reports from abroad do not give such hopeful views of the results as seem to prevail in Baltimore.

At the Naturforscher Congress in Vienna, where clinicians are said to have 1.5 grammes of radium at their command, men like Riehl, Wertheim and others seemed to think that there is nothing in radium destructive to cancer cells specifically, but that the cells were simply too weak to resist the rays, while normal cells have more power of resistance, though they also succumb if the application is too long or too massive. Yet even the cancer cells, they said, were affected only when the rays came directly in contact with them, so that any cancer cells that have been carried to some tissue or organ beyond the reach of the rays can proliferate unhindered. Indeed, it is the opinion of Wertheim that "preceding radium exposures render more difficult the removal of the growth later."

It is a possibility within the bounds of reason that exposures to X-rays or radium rays before operation may so weaken the normal cells that they cannot resist the influence of any malignant element left by the subsequent operation, if deferred.

Knox in the *British Medical Journal,* advocates excision rather than radium, as he finds recurrence so often, even in rodent ulcer.

Sir Alfred Pierce Gould expresses a slightly different view of the action of radium, namely, that "the therapeutic use of radium rests upon its selective affinity for cancer cells, and not upon a general caustic, or destructive power."

Reason teaches that no cancer is cured until every cancer cell is killed or removed. Experience shows that any lesion that contains cancer cells should be disturbed as little as possible unless thoroughly removed, as otherwise it is liable to cast some of the cancer cells into the blood stream whence they will be deposited in some other tissue or organ. Finally, it is a mechanical impossibility for the radium ray to follow such wandering cancer cells to their lodgment and destroy them so as to prevent metastasis; consequently, the hope that in radium we have anything like a sure cure for cancer is not well founded.

There will never be a specific for cancer until some of our earnest searchers shall have found some substance which, when injected into the system of a cancer patient, will cause the blood to become destructive to cancer cells wherever in the system they may be lurking. Until such a specific is discovered, early excision gives the greatest hope. Radium and the X-ray should be reserved for the inoperable cases with the hope of cure only when the lesions are superficial.

MEDICAL DIRECTORIES: WHICH DO YOU PREFER?

There are two general medical directories published in the United States. Each of them claims to give complete and thorough information concerning all the doctors in the country. Both are large volumes, and seem to contain the names and addresses of all the doctors, omitting none. But there is a radical difference between the two directories, and to this difference the JOURNAL invites the attention of its readers.

One of them, in obtaining the information upon which its announcements are based, relies upon the unsupported statement of any

one claiming to be a doctor as to the school at which he graduated, the time and place of his graduation, the honors won, the posts of distinction occupied, and all such matters as a pretender might claim or a modest man omit from his statements. Such partisan statements at once render the statistics untrustworthy. This is one point of difference. Another is the manner of publication of the information thus acquired. A glance at one directory shows great discrimination in the presentation of the claims of different physicians to the confidence of the people. Generally speaking, the majority of the names appear in obscure, small type, and occupy as little space as will express the name and address of the doctor. At the same time other physicians will be represented by much larger type spread over a liberal amount of space, and recounting the honors, positions and societies, and any other element of glory that the man in question sees fit to supply. Anyone claiming to be a doctor, though the most blatant advertising quack, without referece to his character or ability, and no matter what his "race, color, or previous condition of servitude," can have this so-called "extended information" inserted for a specified sum called the price of the directory. The next doctor above or below him in the book may be a famous surgeon or a celebrated internist, yet unless he has surrendered to the hold-up and paid the price, his name will appear trifling and insignificant. This is not imaginary. It is strictly true.

The publishers of the other directory also gather in all possible information directly from the persons interested, but before publishing the name and address and other proper items relating to any doctor, they institute an investigation, regardless of expense, in order to insure the absolute accuracy of every statement that appears in their directory. But this is not the only point of difference between the two books. No amount of money can induce the publishers to introduce into the card of any physician a word, a letter or a mark indicating his superiority or success as compared with that of any other physician whose name appears in their directory. Now, we cannot prevent our names from appearing in the mercenary publication first described, but we can insure their being so inconspicuous that they will not attract attention, by refusing to submit to their hold-up, disguised as it is in the form of a purchase of the book. If you need a directory, purchase the one that does not place the advertising quack on a plane of equality with yourself. Most of us have some time in the past yielded to the weakness of wishing to see our names as conspicuously published as those of some competitor or friend. It's time to quit.

Those who have seen the great directory published by the American Medical Association will easily guess that it is the one referred to when a comprehensive and reliable medical directory is mentioned. Indeed, it is the only medical directory worthy to be seen in an ethical physician's office, and it is of such inestimable value to the medical profession as to deserve a place in the library of every progressive physician.

THE PROMOTION OF COL. GORGAS.

The daily press announces with entire approval the promotion of Col. W. C. Gorgas to the position of Surgeon-General of the United States Army, with the rank of brigadier-general. Though the honor is a high one it is not at all commensurate with the merit and fame of Col. Gorgas. Indeed, it would be difficult under our system of government to properly reward him. The position assigned him is the highest within the gift of the government, but not as distinctive as could be desired, for there have been Surgeon-Generals before, but never before was there a Gorgas. The plain, republican doctrine of Burns that "the rank is but the guinea's stamp," reads very well, but in spite of it any of us would rather have in his pocket a nicely minted golden eagle than a raw lump of gold of the

same value. Most Americans would rejoice to see some new rank established by Congress for the special purpose of honoring the man who made possible the Panama Canal.

DR. EPHRAIM M'DOWELL.

Attention is invited to the accompanying engraving of the monument erected in 1879, at Lexington, Ky., by the Kentucky State Medical Society to the "Father of Ovariotomy." It

is well for workers in his profession to stop in their strenuous labors now and then to consider the value to themselves and to all humanity of the epoch-making innovation introduced by Dr. Ephraim McDowell, of Kentucky; to estimate the preparatory study and experience that enabled him to successfully perform and teach an operation that had always before been considered by the vast majority of surgeons as a murderous impossibility; and to realize the courage and heroism that sustained him during those critical hours when, in his unpretentious office, he waited for the results of a first operation performed in the face of almost universal opposition and protest. The idea, once prevailing, that he was "just one of the ordinary run of country doctors," is now generally dispelled by the knowledge that his medical education was unusually broad for that period, and that he had the great advantage of studying two years at Edinburgh, then a leading medical center of Europe, and enjoyed the tuition of the celebrated surgeon, Dr. John Bell. Such advantages were not generally available to the ordinary country doctor of those days, though now they would not even entitle him to the degre of M.D.

The burden of dread and pain that he lifted from the womanhood of the world is above computation. The lives that have been saved by his example would people an empire. The spirit that thus dared condemnation, ostracism and a violent death at the call of professional duty is of the kind that has immortalized heroes and martyrs through all the generations of men. When his professional children reared to his memory a shaft of granite, its lofty summit fitly symbolized the lofty and unswerving nature of his devotion to duty, and his resolution to do the right regardless of opposition or danger was as invincible as the granite hardness of his memorial. In honoring him the doctors of Kentucky also honored the entire medical profession, and set a standard of duty and daring that the strong workers in every walk in life may well look to for inspiration.

A pilgrimage to the tomb of Dr. McDowell

was planned by the members of the Southern Medical Association at the recent Lexington meeting, but the scientific programs and the entertainments provided by the Lexington professsion did not give time for the trip to Danville. Dr. McDowell, however, was not forgotten. His achievements were referred to by a number of different speakers, and the Southern Medical Association sent a wreath to be placed on his tomb simply to let the world know that Southern physicians cherish the memory of their illustrious dead.

THE SOUTHERN MEDICAL WOMEN'S ASSOCIATION.

The organization of the above named Association at the Lexington meeting of the S. M. A. has again called attention to the position assumed in the medical profession by women who have qualified themselves to undertake its duties and responsibilities. No well qualified person will deny that there are often conditions encountered by medical gentlemen in practice that could be managed as well or better by a qualified woman, if one were present.

The logic of the situation points to woman's service for woman's needs, and under such a ruling, even if surgical cases were excluded, the medical women would not lack for employment. There is little doubt that from now on the woman of pleasant expression and good presence, and who is thoroughly posted in the profession of medicine, will be more and more sought for her services in obstetrics, gynecology, pediatrics and other branches of medicine.

The organization of medical women into such associations as that under consideration must expedite this conclusion. The noble examples presented by the cultured ladies who were placed at the head of the new Association have already achieved for the womanhood of the South a recognition and a standing that no amount of "votes for women" could have accomplished. They have demonstrated the right of women to a place in the deliberations of the medical profession in its most dignified assemblies. They have shown a breadth of view and a steadfastness of purpose in their plans to advance the interests of medical women that partly accounts for their fine success. And, meanwhile, they have preserved the gracious personality of the typical Southern woman and their loyalty to the demands of domesticity. The President of the Southern Medical Woman's Association, Dr. Lillian B. South, is not without experience to aid her in performing the duties of the position, for she is one of the Vice-Presidents of the American Medical Association, the first woman to hold so prominent a position in that organization. She will not be slow to utilize the new opportunties for usefulness to her profession and her sex.

The Vice-President, Dr. Mary Lapham, of Asheville, N. C., is well known through her forceful advocacy of treating advanced pulmonary tuberculosis by compressing the affected lung with nitrogen gas, and thus insuring therapeutic rest to the injured organ. Some of her illustrated articles have appeared in this JOURNAL, and created a profound impression. She has also given much of her valuable time to the service of the public health revival now sweeping the South, and has addressed various meetings in widely scattered localities.

The Secretary-Treasurer of the organization, Dr. Rosa Gant, is a charming type of Southern womanhod in its highest development. She is the devoted wife of a prominent lawyer of Spartanburg, S. C., as well as a busy and successful opthalmologist. Her loyalty to the Southern Medical Association and to the cause of her sister physicians was proven by her act in postponing her submission to a serious operation until after her attendance upon the Lexington meeting. As soon as it was over she hastened to a sanitarium in Charleston, S. C., where she was operated on for appendicitis the day following adjournment.

No goal is too high to be the aim of an organization of such women as these, but their ambition is all for the upbuilding of the entire profession of medicine, the welfare of their own firesides and the honor of their beloved South.

May they all, single or combined, achieve the success they so richly merit! The Southern doctors, without exception, are proud of them and their work, and stand loyally by, ready to aid or defend them against all hostile comers, if such there should be.

AN ANTIDOTE FOR BICHLORIDE POISONING.

A new chemical antidote for poisoning by bichloride of mercury is announced. It depends upon the prompt conversion of the bichloride into calomel upon contact. To produce the change sodium phosphate is suspended in tepid water (not hot water). Sodium bicarbonate, chemically pure, is slowly added, stirring until effervescence ceases and the solution clears. Then a little more of the sodium bicarbonate is added to insure its excess. This solution, it is claimed, instantly converts the bichloride to the mild chloride, which can then be removed by a dose of castor oil. It is very necessary that the sodium phosphate shall be chemically pure.

The antidote must be used within from fifteen to thirty minutes after the ingestion of the poison to be entirely effectual. If further experience demonstrated its usefulness, it remains for the druggists everywhere to have the necessary reagents ready for prompt application.

POISONS.

In "The Toxins and Venoms and Their Antibodies," written by Em. Pozzi-Escat, translated by Alfred I. Cohn, Phar. D., and first published in 1906 (John Wiley & Sons, New York), there are many points of great interest and some of practical value. It throws a light upon some conditions that have been in dispute, namely, whether there is such a thing as being poisoned by eating fresh water mussels, or being made ill by eating oysters in warm weather, although they were not spoiled by keeping. He says: "In the flesh of these crustaceae (the mussel) is found a dangerous toxin called methylotoxin. The flesh of oysters is also unwholesome at the spawning period. The toxic symptoms caused by these animals appear in not less than twenty-four hours after ingestion." Physicians who have had patients seriously ill a day or two after eating mussels or oysters in summer have sometimes doubted whether they were the cause, as so long a time had elapsed. Dr. Pozzi-Escat makes all that clear.

He also states that the blood of eels is so poisonous that half a Cc., or seven and a half drops of their blood serum, injected into a dog "will kill it almost immediately." The same is true of the blood of snakes, even the harmless ones.

The common, "harmless toad," secretes a venom in his skin which is very virulent. It is described as having a "waxy odor and an insupportably bitter taste. It rapidly inflames the nasal, buccal and conjunctival mucosa. It is a true venom, and acts by paralyzing the heart and spinal marrow." Its fearful taste is ample protection against all enemies except hawks, owls and snakes.

A poison that the doctor has more frequently to contend with is knowl as "phallin," and is obtained from the Amanita mushroom, the most poisonous of the toadstools. So deadly is it that one part of phallin to five million parts of animal will cause death in three minutes. One part in fifty million is still fatal though slower in action. It is this form of mushroom poisoning that is most dreaded, for it does not manifest its presence until the poison is absorbed and it is too late to remove it. There is no antidote, and the fortieth of a grain is a fatal dose for a man. Our author says there is very much resemblance between mushroom poison and that secreted by pathogenic bacilli, which are, in fact, miniature

mushrooms or rather, mushrooms are enormously developed bacilli.

NOTICE TO AUTHORS.

Contributors to the pages of this JOURNAL are recognized by its staff as its best friends and supporters. Nevertheless, there are certain matters connected with authorship to which the editors feel obliged to call attention.

In the first place, when an author submits his paper to the Association, or to the editor-in-chief, for publication, it is supposed to be all ready for the printer to put into galley form for inspection and correction. Now these corrections are not expected to include *alterations or additions*. The paper should be correct and complete before going to the printer, and changes of any character except to correct the *mistakes of the printer* are considered extras, consume time, are a source of error and involve unnecessary expense. *They can* be made while the article is in galley form, though they cost us money, but if the corrected galley is retained too long by the author, or for any cause does not reach us before the articles have to be paged and numbered, then we must decline to make the corrections and changes indicated and must rely upon the work done by our own careful proofreaders. Changes then would "tear up" the whole edition, seriously delay its issue, dissatisfy the publisher, and cost more than most authors would be willing to pay.

Moral: Do not send in your article until it is in just the condition in which you wish it to be published.

THERAPEUTICS

DIGESTANTS.

Digestants are agents which stimulate the stomach and pancreas to natural secretion and aid in the digestion of food.

In the first class may be mentioned alcoholic beverages, either with or immediately after meals, in suitable cases.

The form used and the quantity are of importance, but alcoholics have already been considered.

The administration of small doses of an alkali, such as sodium bicarbonate three grains (0.19 gm.) with a like quantity of sodium hydrochloride, in a capsule half an hour before meals is credited with exciting a flow of the digestive juices of the stomach.

The use of moderate amounts of condiments, such as pepper, spice, etc., with the food, has the sanction of reason and experience in its favor.

Those who believe that the utmost simplicity of cooking should be enforced because of the fact that so many people eat to excess and their appetites need no stimulation, must remember that therapeutic agents are for those whose digestive organs are below par. The lack of appetite signifies lack of proper secretion, and the grateful sense of warmth and satisfaction aroused in the stomach by gentle stimulation with or after meals is an indication of increased secretion of all the digestive elements. The chief of these is hydrochloric acid. When it is present in insufficient quantities digestion is imperfect. In all conditions marked by sluggish digestion, whether the contents of the stomach are too acid or not enough so, diluted hydrochloric acid, in doses of 15 drops (1.0 cc.) in water, immediately after meals will be beneficial. Its administration should not be long continued without intermission.

PEPSIN.

Perhaps no other agent in the Pharmacopoeia has been so recklessly, wastefully and uselessly prescribed as has pepsin.

It is the concentrated secretion of the gastric juice secured from the peptic glands of the stomach. It usually occurs in yellowish scales or powder, of a slightly acid reaction, and one grain should digest 3,000 grains (0.06—194.40 gm.) of freshly coagulated and minced egg albumen in warm water acidulated with hydrochloric acid and kept at a temperature of from 100 to 120 degrees F. Alcohol in strength of ten per cent or over impairs its powers of digestion. Alkalies in any amounts, large or small, destroy it. Yet it is not unusual to see prescriptions calling for pepsin and bicarbonate of soda in the same capsule or powder. Any beneficial result experienced by the patient must come from the soda alone, as it has rendered the pepsin inert.

Pepsin does not aid the digestion of starchy, glutenoid or saccharine foods. Its effect is solely upon albuminoid substances, such as the whites of eggs and lean meats. Nevertheless, in cases of weak digestion where only vegetable diet is allowed essence of pepsin, containing as it does dilute hydrochloric acid and a little alcohol, is found to increase the comfort and efficiency of all the digestive organs.

Pepsin is often prescribed in capsules with pancreatin. This is theoretically and practically wrong. The pepsin is useless in an alkaline medium and the pancreatin in an acid one and their only effect is to destroy each other. Several elegant preparations of pepsin and pancreatin are on the market, and are taken with occasional benefit, but this is to be ascribed to the vehicle, which is usually some kind of wine. Nevertheless, it is proper to state that certain experiments have recently suggested that these theories, though verified in the chemical laboratory, meet with another and confusing element when the vital powers and living function enter the problem. Clinical studies have seemed to contradict the pharmacological dictum that pepsin and pancreatin given together neutralize each other. The question is still undecided. When given to reinforce scanty secretion in the stomach the dose should be much larger than is generally prescribed, according to some authorities. It is doubtful if less than ten grains (0.64 gm.) of the best scale pepsin would effect much change in the condition of an ordinary meal during its passage to the pyloric orifice, if the amount given were expected to actually digest the food, and not then unless in the presence of a proper degree of acidulation. When administered it should therefore be followed in half an hour with a dose of diluted hydrochloric acid. On the other hand, it is possible that its presence causes increased secretion.

Acidulated solutions of pepsin are used to predigest the foods which are to be injected into the rectum for absorption. In such cases only a sufficient amount of the fresh beef muscle should be digested at one time for instant use, and the solution should be strained through cheese-cloth before introduction. If eggs are to be predigested they should first be boiled moderately hard and then minced before undergoing the process. Before injecting nutrient enemas they should receive an amount of sodium chloride equivalent to a teaspoonful to the pint.

Six or eight fluid ounces (177.42—236.59 cc.) of the warm mixture is as much as should be used at one time, not to be repeated under four hours.

Certain preparations claimed to be nutrient, predigested beef and malted grain extracts, preserved by an admixture of choice sherry or other wine, are upon the market. The Council on Pharmacy of the American Medical Association has listed two of these as allowable, though not by it endorsed. They are liquid peptonoids a gratefully aromatic preparation of about the same nourishing power as standard sweet milk, and panopepton, another similar preparation, not as palatable but slightly more nourishing. The doses are from two to eight teaspoonfuls every two to six hours (7.39—30.0 cc.), acording to age, or the object aimed at. Strong, aquaeous, acidulated solutions of pepsin have been used to dissolve blood clots in the bladder and the membranes of croup and diphtheria.

In the latter instance frequent sprayings are resorted to with the solution, until the end is accomplished. In the former the solution is injected warm into the bladder through a sterile catheter, and after an hour drawn off and replaced with fresh.

PANCREATIN.

Pancreatin is a mixture of four or five enzymes manufactured by the pancreas in warm blooded animals. It comes in a dingy, soft powder, with a faint meaty odor and taste. It has no effect upon albuminoid substances, but is capable, when fresh, of emulsifying fats, and rendering starch soluble in water, first transforming it into sugar.

It is effectual only in an alkaline medium, and if long in contact with a mineral acid, loses all its power.

Pancreatin is a more generally valuable agent than pepsin, though less frequently prescribed. It peptonizes gruel, oysters and soups, and will first coagulate and then peptonize milk. It is more useful than pepsin in preparing nutrient enemas, as its vehicle must be alkaline, not acid, and therefore less irritating to the rectum.

It is undoubtedly useful in intestinal indigestion if properly administered. It should be given in capsules, two hours after meals, in doses of 10 to 15 grains (0.64—1.0 gm.) with an equal quantity of bicarbonate of soda. Three capsules will carry the dose if well made.

The object is to have the medicine swept through the pyloric orifice with the partly digested food and do its work in the small intestine. The cases most benefited by this treatment are those that experience a sense of heaviness and discomfort in the abdominal region several hours after meals.

Pancreatin is also used like pepsin for the solution of blood clots consequent upon hemorrhage in the bladder.

MALT.

Malt extracts have long been considered beneficial to weak digestions. On account of scientific considerations, malt was omitted from the official list in the Pharmacopoeia of 1890, but on account of clinical considerations it was restored in a later edition.

The best extract of malt is that which nearest resembles good porter, or "Brown Stout." It is, theoretically, more of a food than a medicine, but every physician of wide experience knows that in some cases it will restore the appetite, digestion and strength to an invalid or convalescent with gratifying rapidity if suited to the case. The maltines, though doubtless claiming more upon their labels than their constituent elements warrant, are yet useful in cases of incipient dyspepsia. Admixtures of maltine or of malt extract with pepsin are not to be depended upon, but the plain product is often useful.

Taka diastase is a mould that grows upon steamed rice. It has been used for centuries by the Japanese brewers for hastening the brewing of their beers. It is a yellowish powder, hygroscopic, and soluble in water. It is very powerful under favorable surroundings, converting 100 times its weight of starch into sugar. Whether it accomplishes similar work when mixed with food in the digestive organs is a debatable point, but very many clinicians believe in its usefulness. It is furnished either in the solid form, or as a fluid, liquid taka diastase. Of the former the dose is from 2 to 5 grains (0.12—0.32 gm.). Of the latter, from ½ to 2 fluid drachms (2.0—8.0 cc.). It should be taken immediately after food. Papoid, papain or papayotin are names given to the inspissated juice of a South American fruit, carica papaya. It is a whitish powder readily soluble in water and possesses the power to render soluble and digestible all the elements of nutrition. It promptly converts starch into dextrose, and is very efficient in dissolving the membranes of croup and diphtheria and blood clots in the bladder.

It acts indifferently in either alkaline or acid media. Theoretically it should be more efficient than either pepsin, pancreatin or diastaste, but clinical evidence teaches the contrary, though it is still sometimes prescribed. Dose 1 to 8 grains (0.06—0.51 gm.).

CORRESPONDENCE

A COMMISSION FOR THE STUDY, PREVENTION AND ERADICATION OF VENEREAL DISEASE IN THE SOUTHERN STATES.

Hot Springs, Ark., Jan. 15, 1914.

Editor Southern Medical Journal:

The duty of the medical profession is first civic, that of promotion of health and prevention of disease, not of the individual but of the community. Healing the sick—earning a living—is secondary or even incidental. It is true that this duty is self-imposed, but it is necessarily so because medical men, as a class, constitute the only ones that understand the cause of disease, its propagation and methods of prevention.

The South, on account of racial, climatic, topographic and economic conditions, has to face a situation peculiar to itself, and thus far full well has she done her duty, but her galaxy of stars only guide the way that a well beaten path may be trod.

To conquer a disease is more important, more epoch-making, than to conquer an army; the saving of life and building national prosperity more worthy than spilling of blood and laying in waste. This the South has done! The erudite Nott suggested the way, the scholarly Cabell first organized the forces, and the indefatigable Reed with the martyr, Lazar, commanded the firing line—and yellow fever was conquered.

The work did not cease when the fight against yellow fever was won. Other foes had surreptitiously made their invasion, and ancient enemies remained defiant; these are yet to be conquered. The Malaria Commission of the Southern Medical Association, with its Bass, Deaderick, Henson, Craig, Thayer and others, America's foremost authorities on the subject, has realized its possibility, and shows signs of activity; the Hookworm Commission is vigorously at work and accomplishing untold good, and there is yet a possibility that the Pellagra Commission may blossom forth and bear fruit.

With yellow fever disposed of, malaria, uncinariasis and pellagra receiving competent attention, can we not devote some effort to the control and eradication of the greatest scourge of all—venereal disease?

The venereal disease is not peculiar to the South, nor does it prevail more extensively here

than elsewhere, but this does not lessen our duty or lighten our burden. Racial and economic conditions make it a special problem for us, and we must accept it for our own protection. The extent of the ramifications has never been investigated, no survey made or effort made to control its spread.

A filthy, polluted body endangers the innocent, pelvic operations destroy posterity, blind asylums are expensive, and insane hospitals mark the nation's decay; and all these are increasing, yet nothing is being done to stay the tide.

The Southern Medical Association needs a commission for the study and prevention of venereal disease. The work of such commission, briefly, would be as follows:

1. Gathering information and compiling statistics:
   (A) Prevalence of venereal disease in (a) the negro race, (b) Caucasian race.
   (B) Extent of transmission of venereal disease and the method of transmission, (a) sexually, (b) innocently.
   (C) Existing and past legislation, with results.
   (D) Estimation of the ecomonic results of these diseases.
2. Dissemination of information:
   (A) The gravity and end results of neglected venereal disease.
   (B) Methods of prevention.
   (C) Importance and possibility of cure.
   (D) Campaign of education for physicians.
3. Recommending to and assisting bodies endeavoring to prevent or minimize venereal disease, and attempting to stimulate proper legislation.

ABNER H. COOK, M.D.

SOUTHERN MEDICAL NEWS

ALABAMA.

On December 11 the Barbour County Medical Society elected officers for 1914: For President, Dr. W. R. Belcher, of Baker Hill; Vice-President, Dr. B. F. Jackson, of Clayton. Dr. J. J. Winn, of Clayton, was elected County Physician, and Dr. J. F. Tillman, of Clio, County Health Officer.

On December 11 the Colbert County Medical Society met in annual session at Tuscumbia. The following officers were elected for the coming year: Dr. W. H. Green, President; Dr. W. A. Finley, Vice-President; Dr. J. T. Haney, Secretary and Treasurer and County Health Officer.

On December 11 the Bibb County Medical Society met at Centreville. Dr. H. C. Thomas, of West Blocton, was elected President; Dr. J. G. Vance, of Marvel, Vice-President; Dr. H. L. Cunningham, Secretary-Treasurer. Dr. W. J. Nicholson, of Centreville, was elected County Physician.

At Birmingham, where a free dispensary is to be erected, a certain concern offered to do the work at cost without any profit, whereupon the Builders' Exchange formulated a protest against the contract being awarded on such terms. They claim that "the laborer is worthy of his hire," and that work done under such conditions might actually cost more money where no sum was specified than it would under conditions of proper competition.

At the annual meeting of the Jefferson County Medical Association in December the following officers were elected for the ensuing year: Dr. J. M. Mason, President; Dr. Ben Ferguson, Vice-President, and Dr. H. P. Shugerman, Secretary and Treasurer. Dr. R. M. Cunningham was re-elected censor to serve for five years.

At the December meeting of the Dallas County Medical Society, at Selma, the following officers were elected for the ensuing year: Dr. T. G. Howard, President; Dr E. B. Allison, Vice-President; Dr. Clarence Elebash, Secretary, and Dr. J. S. Chisholm, Treasurer. Dr. Howard was also elected County Health Officer and Dr. Chisholm, City Physician.

At Goodwater the death of Dr. W. A. Holloway some two months ago, which was supposed to have been caused by an accidental fall, is now believed to have been a murder. Some suspicions having been aroused, Mr. Wiggins, of the detective force, caused his remains to be exhumed. He found abundant evidence at the autopsy of brutal violence which could not have been caused by a fall Three men have since been arrested on suspicion.

At Birmingham in December the citizens were warned against smallpox and advised to be vaccinated. They were told it is very important and that those who cared to apply at the City Hall would receive free vaccination.

Dr. R. M. Cunningham, for so many years chief surgeon of the Tennessee Coal, Iron & Railroad Company, has resigned his position and established himself in the city of Birmingham.

At Bessemer every citizen young and old is required by the city officials to be vaccinated against smallpox or show a good scar. The disease has been confined to the negro district thus far.

ARKANSAS.

At Conway, Faulkner County, the doctors of the Hookworm Commission report that of 2,086 examinations made during the first weeks of the campaign only 23 cases of hookworm infection were discovered.

At Fort Smith the family of Dr. L. W. Poyner were alarmed by the return of his horse without himself. He was found where his horse had thrown him, unconscious and with a broken arm and leg. He is well and widely known, having served Carroll County in the Legislature.

At Pine Bluff fourteen applicants successfully passed the examination before the State Board of Medical Examiners and received their licenses to practice medicine.

Governor George W. Hays has allowed the

(Continued on Advertising Page 18.)

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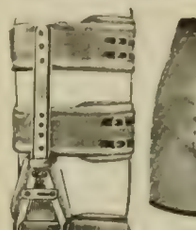

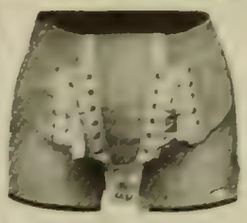

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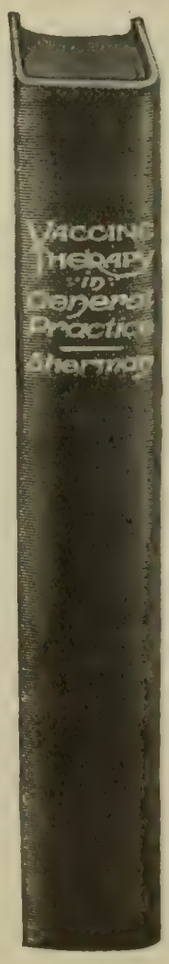

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MEDICAL NEWS

(Continued from Page 170.)

State Board of Health to draw upon the State printing fund for $1,000 to pay for the necessary printing of forms and other blanks indispensable in the work of the Bureau of Vital Statistics.

At Searcy, Dr. T. M. Fly, after a two weeks' investigation in White County, could find but thirty-three cases of hookworm. With Dr. J. M. Jilds, County Health Officer, he lectured at the rural schools on sanitation and the prevention of disease.

DISTRICT OF COLUMBIA.

The Medical Society of the District of Columbia, at its December meeting, unanimously adopted resolutions urging the reappointment of Admiral Charles F. Stokes, Surgeon General of the United States Navy, whose term is soon to expire. He was apointed by former President Taft four years ago.

An estimate of $350,000 to build new quarters for the Army Medical School was submitted to the War Department by Surgeon General Torney in December. The school now occupies rented quarters.

Speaking of the delegation to the Congress to protest against vivisection, Dr. Harry Lewis, Director and Superintendent of Emergency Hospital, and Dr. C. P. King, resident physician at Casualty Hospital, stated that without doubt the delegates were sincere and well-meaning, but their efforts were misdirected.

It has been decided to raise the entrance standard of the department of medicine of the George Washington University beginning January 1, 1914. Those entering hereafter must have had at least one year of college work.

Army authorities are trying to obtain from Congress a grant of $300,000 for the erection of an army medical school on the Government reservation at the Walter Reed Hospital.

Stanhope O. Crane called at police headquarters to arrange it so that President Wilson would order the arrest of every physician in the United States on the charge of perjury, treason and conspiracy. He was sent back to the sanitarium at Towson, Md., where he had been under treatment up to a month ago.

FLORIDA.

At St. Petersburg, December 23, nine Chiropractors, or so-called drugless doctors, were arrested on warrants sworn out by J. S. Mullen, county attorney for Pinellas County. As usual, they claim not to be practicing medicine, because they do not use drugs.

At Tallahassee the Board of Commissioners of State Institutions has elected Dr. Drew R. Handley, of Worthington Springs, physician at the State prison farm. There were numerous applicants for the position.

The Madison County Medical Society was organized in December. It is said that they resolved that old bills should be paid by their patients before making new ones. They will continue to do charity work.

In Jacksonville the Associated Charities has organized a clinical dispensary which will be served by the best physicians and nurses in the city without pay, for the benefit of the poor. It is located at the corner of Orange and Main streets. At the opening there were present many mothers with sick babies, as well as several types of Uncle Remus.

At the State Laboratory in Hillsborough County the Medical Society elected the following officers: Dr. J. C. Knight, President; Dr. J. C. Dickerson, Vice-President; Dr. G. H. Hodgson, Secretary, and Dr. D. E. Saxton, Treasurer.

Dr. Harold Beardoll, of Orlando, recently married Miss Laura G. Fagon, of Charleston, S. C. He is a partner of Dr. John McEwan.

Dr. G. H. Benton, of Miami, has opened his new offices in the Burdine building. He has also opened the Sterling-Worth Sanatorium.

At Miami, Dr. Sarah Elliott, of Lake Worth, brought a patient to the city for medical attention, but was herself stricken with apoplexy and within an hour was lying dead at the city hospital, where her patient was resting easily, unconscious of his doctor's fate.

GEORGIA.

At Savannah, Dr. Harry Y. Righton, coroner, has suffered for two weeks with an attack of tetanus resulting from a cut in the hand with a dirty penknife. Being apprehensive of tentanus he immediately injected antitoxin into his system. Physicians who were called to his assistance agree that his prompt action saved his life by modifying what would have been a very violent attack.

At the recent meeting in Atlanta of the Southern Surgical and Gynecological Association eight applicants for election to fellowship were accepted among eighty candidates. Dr. John Wesley Long, of Greensboro, N. C., was elected President.

Governor Slaton has commuted the sentence of Dr. W. F. Whitehead, the Columbus physician who was serving a twelve-months' term for a criminal operation. He had already served ten months.

Dr. W. S. Elkin, of Atlanta, has been appointed Chairman of the health department of the Child Welfare Exhibit, where every phase of a child's health is studied.

At Macon the Board of Education has decided to appoint medical inspectors for the city schools.

Governor Slaton has appointed Dr. W. L. Funkhauser, of Rome, as a member of the State Board of Health. He succeeds Dr. R. M. Harbin, of Rome, who declines reappointment.

At Waycross, Dr. T. F. Abercrombie has examined 980 persons for hookworm in Ware County, of whom 366 were found infected. From one 18-year-old white boy living in a country town one treatment expelled 2,700 hookworms. That was last year. The recent examination was negative and he had gained 52 pounds.

At Macon the City Council has provided for four city physicians, one in each of the city wards.

Dr. W. A. Boyd, a young physician who came to Macon several months ago from Connecticut, and Christopher Columbus, a negro, have been com-

Continued on Advertising Page 20.)

A NEW IDEA IN ABDOMINAL SUPPORTERS

The "B. P." Supporter

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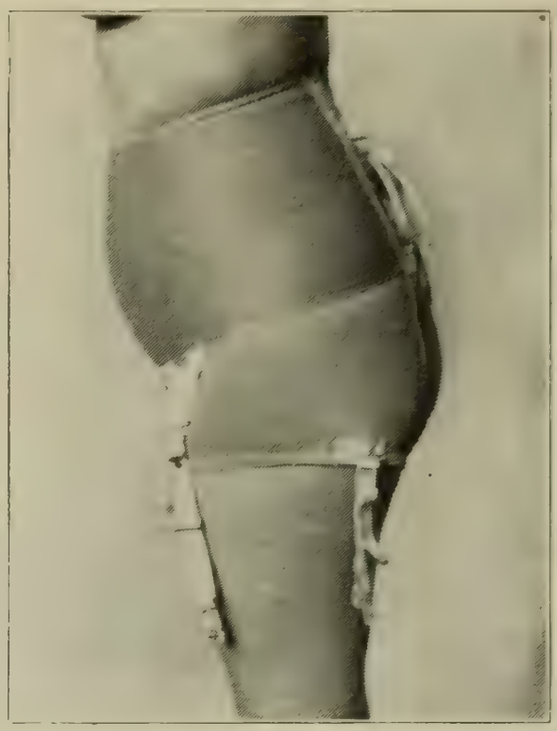

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MEDICAL NEWS

(Continued from Advertising Page 18.)

mitted to the county jail charged with an offense punishable with life imprisonment.

Dr. Victor H. Bassett, city bacteriologist of Savannah, upon his return from the Lexington meeting of the S. M. A., stated that in proportion to population Savannah affords more protection to the public from the dangers of impure milk than Chicago.

At Atlanta a Dr. L. C. Young, an aged man who came to Atlanta from Ontario, Canada, a few months ago, died under mysterious circumstances that suggested either internal cancer or arsenical poisoning. An investigation is under way.

KENTUCKY.

At Covington, in Kenton County, the Board of Health was enjoined by the Circuit Court from enforcing stringent regulations of the city dairies. The Court of Appeals has dissolved the injunction and upheld the power of the Board to establish such regulations as they considered essential to the protection of the health of the community unless "unreasonable or oppressive." The court further declared that the powers of local boards of health are not derived from the City Council, but from the statutes.

Dr. W. E. Gardner, Superintendent of the Central State Hospital, Lakeland, Ky., has asked the Jeffersonville authorities to be on the lookout for Felix Goldsmith, who is missing from the asylum. His home is in Covington.

In Rowan County the State Board of Health has made a thorough campaign of the public schools. The heaviest infection was found in the Brushy district, where out of 130 persons examined 119 were found to be infected with hookworm.

At Louisville a warrant was sworn out charging Wiliam Ruby, of 232 South Eighth street, with practicing medicine without a license. He claims to practice only massage, for which he holds a license, and to sell roots and herbs that he thinks will help people "who tell him what their troubles are."

At Winchester the city and county boards of health have decided that it is not necessary to enforce compulsory vaccination on account of smallpox at the present time. On the other hand, the State Board of Health warns the people that there is a possibility of a widespread and costly epidemic unless officials, physicians and people recognize and meet the danger.

LOUISIANA.

At Lafayette, November 22, Dr. A. J. Burkett, aged 64 years, died at his residence near the city. He was a native of Northern Louisiana.

At Lake Charles smallpox appeared in August. Since that time until December occasional cases have appeared, but on the 10th of December the health officer discharged the last case as cured and the town is now free of the disease. However, no child is admitted to the schools without a vaccination certificate or a satisfactory scar.

The State Board of Health has appointed Dr. G. Farrar Patton State Registrar of Vital Statistics. He has been a member of the State Board since 1892.

In New Orleans the commissioners of the Sickles Fund announce that a branch dispensary is in operation at the New Orleans Dispensary for Women and Children for the free dispensing of drugs and prescriptions. Any bona fide resident of the city too poor to pay can be a beneficiary.

At Shreveport the City Council has declined to submit to the voters a proposition to set aside five per cent of the city's gross revenues as the minimum appropriation for the City Board of Health.

At DeRidder compulsory vaccination has been declared to protect the high school against smallpox.

At Houma several traveling shows which were booked for that town have been advised to keep away on account of smallpox. While in that town Dr. J. H. White, of the United States Marine Hospital Service, made a great many blood smears from white and colored persons seeking for malaria-carriers, but failed to find one, though there is marshy ground near Houma.

At New Orleans the Charity Hospital is establishing equipment that will enable it hereafter to make its own serums and vaccines, at a saving of from $7,000 to $9,000 a year.

Mr. A. D. Theodore, of Opelousas, has filed suit in the District Court at Crowley against Dr. E. E. Ellis, asking for $35,500 damages for injuries alleged to have resulted from certain operations.

At New Orleans a Mrs. L. D. Mayer has sued Dr. George W. Faivre claiming that he has slandered her by saying that she was a drug fiend. She wants $10,000 damages.

MARYLAND.

Dr. William Tatum, veterinary surgeon of Norbeck, was instantly killed when a heavy pole, upon which were suspended the carcasses of hogs he had slaughtered, fell upon him. His neck was broken.

At St. Luke's Hospital, in Baltimore, it is said that a new test for the presence of cancer is undergoing careful investigation. It is thought to be superior to those heretofore in use.

Dr. Howard A. Kelly wants some one with $1,000,000 or more and philanthropic impulse to endow a radium institute for the treatment of cancer. He believes that such a gift would relieve an untold amount of human suffering. Speaking of the seizure of the radium mines by the government, he said that only any amount in excess of seven grams (105 grains) would be thus taken by the government, as any amount up to that would be taken by Dr. Kelly and Dr. James Douglas, President of the Phelps-Dodge Company, New York, and the head of Memorial Hospital in that city.

Dr. George H. Lebret, chief resident physician of St. Luke's Hospital, Baltimore, has resigned to take a position as head medical officer of the Givven Hospital at Stamford, Conn.

Dr. Henry J. Evans, former President of the Maryland State Homeopathic Medical Society, died at Holidaysburg, Pa., where he went several months ago in an effort to regain his health. He leaves a widow, a son and a daughter.

(Continued on Advertising Page 22.)

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is the only instrument that will give you an accurate and simple means of contrasting one sound with another. Its Acoustic Rheotome exaggerates, reduces, graduates all sounds that pass through it. Regulates them with absolute accuracy. Of unquestionable value in all diagnostic examinations for the different pathological changes of the muscular system of the heart, lungs and blood vessels.

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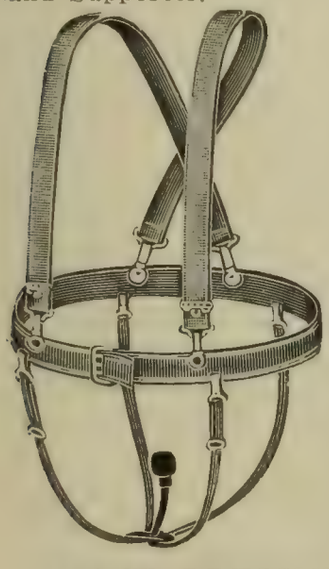

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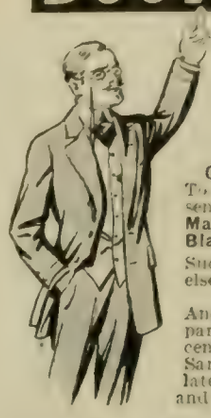

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$4 SATIN LINING FREE

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Abdominal Supporters, Elastic Hose, Surgical Corsets. DOCTOR, send for our catalogue.

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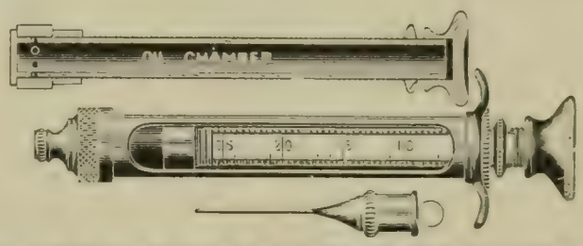

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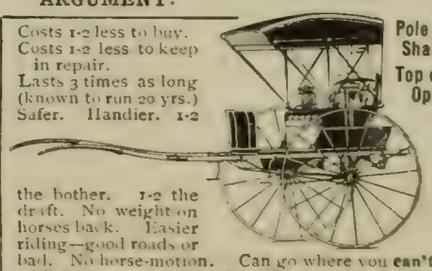
Safer. Handier. 1-2 the bother. 1-2 the draft. No weight on horses back. Easier riding—good roads or bad. No horse-motion. Can go where you **can't** with a buggy. A vehicle for hard service. Pays for itself in saving of horse flesh and horse feed.



Write for Circular B and Sheet of Testimony

The Eureka Co., Rock Falls, Ill.

MEDICAL NEWS

(Continued from Advertising Page 20.)

MISSISSIPPI.

The State Board of Health has submitted to the Legislature a schedule of the sums of money it considers desirable for the conduct of health work during the years 1914-1915. The total amount is about $82,000.

At Newton, Dr. J. C. McElroy, an old Confederate veteran eighty-nine years of age, died at his home in December. Not only was he a Confederate, but he had also served through the Mexican war as a surgeon in the army.

At Jackson some time during December Dr. Harvey W. Wiley, the food expert, came from New Orleans to address the students of the Mississippi College on the subject of "Public Health an Asset."

NORTH CAROLINA.

Dr. James A. Sexton, formerly one of Raleigh's prominent physicians, died on January 7 at his home at Harnett, Harnett County. He had given up practice many years ago and had been in ill health for a long time.

Dr. H. R. Carter, of the United States Public Health Service, who has made a sanitary survey of Newbern and the surrounding country in company with Dr. von Ezdorf, reports that they found a much larger proportion of the colored residents infected with malaria than white people. Out of approximately 400 colored persons examined, 42 were infected, while of 300 white people, only 6 harbored the malarial parasite.

OKLAHOMA.

At Sapalpa it is said that a cat which had been used by a physician as a means of detecting the presence of diphtheria, in a swab he had taken, escaped and infected many other cats in the neighborhood. The result was an epidemic of diphtheria among the children. The State Board of Health now holds that when a doctor reports more than one case of "membranous croup" he is permitting the spread of diphtheria.

At Lawton, Dr. George Pugh was thrown from his buggy. He sustained two fractures of the elbow.

At Blackwell the Kay County Medical Society met in annual session in December at the new Blackwell Hospital with twenty physicians in attendance, almost every town in the county being represented.

At Oklahoma City the county courthouse became infected with smallpox by the visits of persons suffering with the disease. It was turned over to the county physician, Dr. Maxwell, for fumigation.

SOUTH CAROLINA.

Dr. James A. Hayne, State Health Officer, states in his report that there were in the State altogether 49 cases of cerebro-spinal meningitis during 1913, and that it was not epidemic at any point. He is highly pleased with the action of the Flexner serum and hopes the Legislature will provide means for its further distribution.

Dr. Francis L. Parker, who died in Charleston recently, was one of the most distinguished and best beloved surgeons and physicians in South Carolina. He was a brave and gallant surgeon of the Confederacy and a born leader of men.

More cases of pellagra by a considerable number were reported to the State Board of Health in 1913 than in 1912. In Spartanburg County they increased from 105 to 415 in number. The increase was due more to better reporting than to actual multiplication.

In the examinations held before the State Board in November for licenses to practice medicine there were 44 applicants. Of these only 18 succeeded.

The Greenwood County Medical Society elected the following officers for the ensuing year: President, Dr. J. S. Fooshee; Vice-President, Dr. J. D. Harrison; Secretary-Treasurer, Dr. J. F. Simmons.

The State Health Officer complains that the physicians in South Carolina do not properly report contagious diseases. He notifies the people that the disease, scarlet fever, has a short period of incubation, so that if the patient can be isolated from the rest of the family and no children of that family are allowed to attend school for twelve days, that its spread can be controlled.

TENNESSEE.

Dr. C. A. Bailey, assistant surgeon of the United States Public Health Service, has been at Nashville in conference with the State health officers and the Superintendent of Public Istruction, arranging plans for the investigation of trachoma in the counties of upper East Tennessee. Considerable infection has been found in that region.

At Memphis, Dr. Alexander O. Erskine, pioneer physician and Confederate soldier, died December 13, aged 81 years. His wife and six children were in attendance at his bedside.

At Columbia the Middle Tennessee Medical Association elected as officers for the ensuing year G. E. Hatcher, President, Nashville; O. J. Porter, Nashville, Vice-President, and R. W. Billington, Secretary-Treasurer. The next meeting will be at Bell Buckle, May 21.

Governor Hooper has appointed Dr. Vincent A. Biggs, of Martin, a member of the State Board of Health to succeed Dr. Louis Leroy, of Memphis, resigned.

The Board of Control of the Medical Department of Vanderbilt University has authorized the addition of a chair of pathology to the faculty. It is proposed that the addition be made in time for the opening of the school next year.

At Vanderbilt University the Governing Board has appointed Dr. L. E. Burch Acting Dean of the Medical Department for the current year. The board also organized an Advisory Council consisting of five members of the medical faculty including the Dean. They will aid in administering the affairs of the Medical Department.

Dr. G. W. Langs, living in the fourteenth civil district of Davidson County, was convicted of practicing medicine without a license. The punishment for such an offense is a fine of not more than $500.

Dr. J. M. Tracy, of Memphis, was arrested by

(Continued on Advertising Page 24.

WASSERMANN TEST

In every complement-fixation test for syphilis made in our laboratory, we employ both the original Wassermann sheep-hemolytic system and the Noguchi human-hemolytic system. In this way we are able more accurately to control our results so that our reports have a greatly increased value over those for which the single system is used. Our fee for this test is $10.00.

COMPLEMENT-FIXATION TEST FOR GONORRHEA	$10.00
ABDERHALDEN'S SERO-DIAGNOSIS OF PREGNANCY	10.00
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IS A MORE POWERFUL ANTISEPTIC
IS POSITIVELY NON TOXIC
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If mistaken for a "headache tablet", no tragedy can result.

CHINOSOL CO.
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54 SOUTH ST., N. Y

Sample and Full Literature on Request.

MEDICAL NEWS

(Continued from Advertising Page 22.)

the United States Marshal on the charge of using the mails to defraud. He was a liberal advertiser and is said to have secured much money as a result of misrepresentation. He was held under $2,000 bond for the court that convenes in May.

TEXAS.

On December 10 the Houston Anti-Tuberculosis Dispensary opened for business with a reception at 8 o'clock p. m. A large and representative company attended and were addressed by Dr. W. S. Lockhart, Judge W. H. Ward and others. Refreshments were served by a staff of trained nurses in uniform. The dispensary is organized for the purpose of making early diagnoses in tubercular cases.

At Brownwood the Brown County Medical Society appointed a committee composed of Drs. M. M. Scott, W. B. Anderson and J. W. Pendleton, to confer with the City Council in the matter of selecting a competent sanitary engineer who will see to it that the proposed chemical filtered water is kept in such condition as to protect the public health.

At Fort Worth, Dr. K. H. Beall was elected President of the North Texas Medical Association in December. Gainsville was selected as the next meeting place.

On December 11, at Bonham, Dr. J. S. Dorset died at the family home on West Fifth street. He leaves five children.

At Brownsville, November 24, Dr. T. E. Nott, the well-known physician and surgeon, died from tetanus. The remains were sent to Spartanburg, S. C., his former home.

On Monday night, December 1, the McLennan County Medical Society gave its annual banquet at Waco. The weather was so severe that few beside local physicians attended, yet about seventy-five sat down to the feast, quite a number of ladies being among them. Dr. J. P. Harrington was toastmaster.

VIRGINIA.

Dr. Wm. S. Wiley, son of Dr. George E. Wiley, of Bristol, has left that town and moved to Texas for the practice of his profession. He spoke of selecting Dallas as his future residence.

The Norfolk Dispatch announces the death of Dr. J. D. Frazier. He was dragged to death by a runaway horse and was found on the roadside near his home.

Dr. Walter P. Rhodes was arrested by the Henrico police on a charge of practicing medicine without a license. He had advised the application of a cornmeal plaster to a fatal gunshot wound and had accepted two dollars for the treatment. He was released under $100 bond, but when his case was called he did not respond and the bond was declared forfeited.

In December 43 white men, one white woman, one colored man and one colored woman stood the examination before the State Board of Medical Examiners. The results have not been reported at the time of this writing.

Dr. Thomas Judson Wright, of Churchland, died in a hospital at Norfolk from injuries received by a fall from his horse. He was in his 69th year.

Dr. Gray G. Holladay, of Norfolk, has received a commission in the medical reserve corps of the United States Navy.

At Wheeling, Dr. A. U. Weinberger has been added to the staff of physicians of the dispensary of the Ohio Valley Anti-Tuberculosis League.

WEST VIRGINIA.

Dr. William Lewis Judkins, of Barnesville, died in Mt. Carmel Hospital, Columbus, where he was taken for an operation.

At Wheeling late in November Judge H. C. Hervey rendered a decision in the long-pending case of the "United Doctors." He reversed the decision of the State Board of Health, which had revoked the licenses of the "United Doctors" on the ground that the evidence submitted was not sufficient to sustain the charges.

At New Martinsville following the discovery of two smallpox cases in the city the citizens in general, old and young, submitted to public vaccination.

News has reached Raleigh of the wedding on Christmas day, in Huntington, of Dr. Howard McCollogh, chief medical examiner of the public service commission, and Miss LaJoie Stalnaker.

WOMAN'S BELT, FRONT VIEW

The "Storm Binder" Abdominal Supporter

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Sodium Sulphate	50.005
Magnesium Sulphate	30.971
Calcium Sulphate	2.817
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Magnesium Carbonate	.352
Iron Oxid and Alumina	.016
Silica	.005
Total Solids	86.669

The water was excellent from a sanitary standpoint.

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THE COLUMBUS LABORATORIES.
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ANYONE CAN ERECT IN TEN HOURS

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By the most advanced technique

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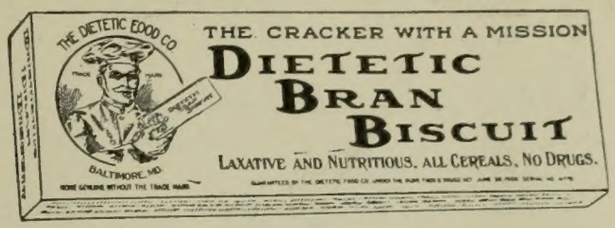

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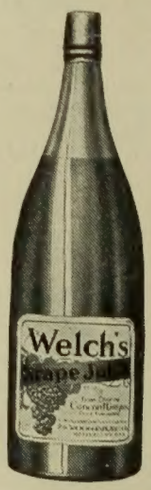

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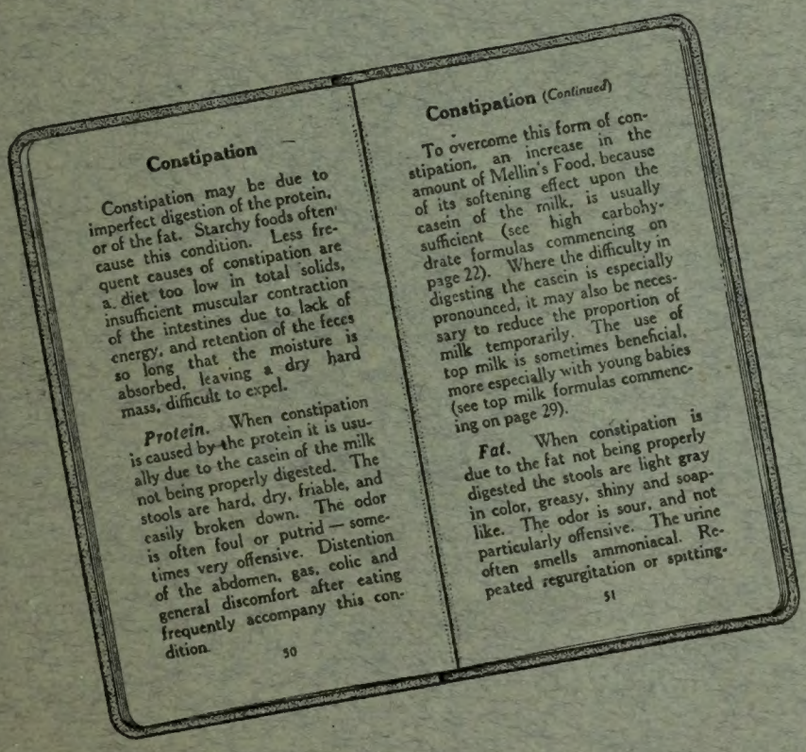

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Constipation may be due to imperfect digestion of the protein, or of the fat. Starchy foods often cause this condition. Less frequent causes of constipation are a diet too low in total solids, insufficient muscular contraction of the intestines due to lack of energy, and retention of the feces so long that the moisture is absorbed, leaving a dry hard mass, difficult to expel.

Protein. When constipation is caused by the protein it is usually due to the casein of the milk not being properly digested. The stools are hard, dry, friable, and easily broken down. The odor is often foul or putrid — sometimes very offensive. Distention of the abdomen, gas, colic and general discomfort after eating frequently accompany this condition.

50

Constipation (*Continued*)

To overcome this form of constipation, an increase in the amount of Mellin's Food, because of its softening effect upon the casein of the milk, is usually sufficient (see high carbohydrate formulas commencing on page 22). Where the difficulty in digesting the casein is especially pronounced, it may also be necessary to reduce the proportion of milk temporarily. The use of top milk is sometimes beneficial, more especially with young babies (see top milk formulas commencing on page 29).

Fat. When constipation is due to the fat not being properly digested the stools are light gray in color, greasy, shiny and soap-like. The odor is sour, and not particularly offensive. The urine often smells ammoniacal. Repeated regurgitation or spitting-

51

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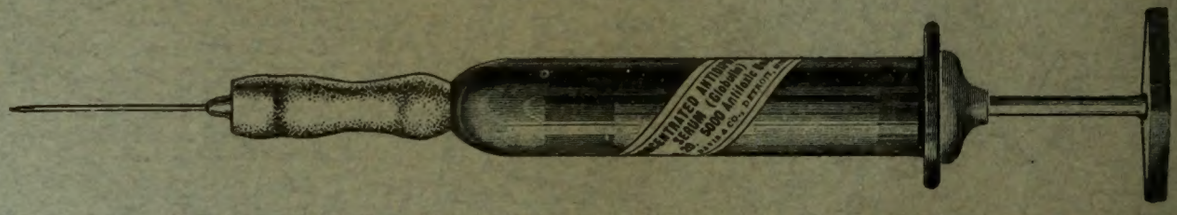

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